

COMPUTERWORLD

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Polish DPers Caught Up In Labor Fight

By Bohdan O. Szuprowicz
Special to CW

Poland's computer industry and its 60,000-person work force have been swept up in the labor movement that is spreading like wildfire throughout the country.

DPers in Poland were included early on in the communist government's agreement to allow the formation of independent trade unions, the result of worker strikes and negotiations at the Gdansk shipyards last summer.

By October, the first general meeting of the Independent Self-Governing DP Workers Trade Union (NSZZP) had taken place in Warsaw. The meeting elected a group of union leaders, announced a set of guidelines on how to organize local union chapters throughout the country and compiled a list of 29 points in a plan of action that was published by the hitherto government-controlled computer industry monthly magazine *Informatyka* in its November 1980 issue.

Basically, the newly formed DP workers' union claims to follow the line of the independent workers' union "Solidarity," which, under the leadership of Lech Walesa, gained so much (Continued on Page 8)

Users Group Asks for Update Of System 2000

By Lois Paul
CW Staff

AUSTIN, Texas — What enhancements to Intel Corp.'s System 2000/80 data base management system (DBMS) do users most want to see?

Announced at the spring meeting of the Association of System 2000 Users for Technical Exchange (Astute) here

'Having users vote on enhancements . . . is the best way Intel can obtain feedback.'

last week, the top 10 most requested enhancements, as voted on by users over the last five months, include:

1. Move tree command in Intel's self-contained facility (SCF).
2. IBM return codes, which would provide request and report writer users with the ability to conditionally execute the next step.
3. Functions in the "where" clause, which would move processing to the DBMS and increase efficiency and ease of use.
4. Extend limit to include CPU and I/O, which would provide management of the unknown for the ad-hoc

(Continued on Page 8)

PCMs Challenge IBM For User Satisfaction

By Tom Henkel
CW Staff

DELRAN, N.J. — Users of IBM plug-compatible mainframes are about as pleased with their processors as IBM users are with the real thing.

In its recently released 1980 survey of plug-compatible mainframes, Datapro Research Corp. found that users of Amdahl Corp., Magnuson Computer Systems, Inc. and National Advanced Systems (NAS) processors tend to be slightly more pleased than users of IBM systems. Users of Control Data Corp.'s IBM-compatible Omega series, however, say they are less happy than IBM users.

Datapro rated the processors on 14 separate criteria. Users were asked to evaluate their systems on each criterion using a four-point scale — a four meant excellent, three meant good, two was fair and one poor.

In descending order of overall user satisfaction, Amdahl systems scored 3.6; Magnuson scored 3.5; NAS systems pulled 3.2; IBM's 370, 4300 and 30 series received a 3.1 rating; and CDC systems scored 2.8, according to the report.

Datapro contacted 44 Amdahl users (about 17% of the installed base), 37

NAS users (about 13%), seven CDC Omega 480 users (about 4%) and three Magnuson users (about 3%).

For comparison, Datapro contacted 732 IBM 370 users (about 7% of the installed base), 49 4300 users (about 3%) and 213 30 series users (about 9%).

Asked to rate ease of operation, users gave Magnuson the highest possible rating of 4 (although only three users were contacted); Amdahl systems scored 3.6; NAS systems scored 3.6; CDC systems scored 3.5. In the same category, IBM's 370 line was given a 3.2, the 4300 a 3.5 and the 30 series a 3.0, according to Datapro.

In the processor reliability category, Amdahl was rated highest with a 3.6. (Continued on Page 6)

Burroughs Told To Release Data — Again

By Tim Scannell
CW Staff

TWIN FALLS, Idaho — For the second time this year, a district court judge has ordered Burroughs Corp. to turn over to a local user all documents related to its B800 computer and B800 operating system software. The user, Century Automotive, Inc., is suing Burroughs over an allegedly defective B800 system.

The vendor has until June 12 to comply with the judge's order.

The judge's recent decision came after weeks of pretrial haggling by Burroughs and Century Automotive over just what material should be covered under the original request, filed in mid-January [CW, Jan. 19]. Century Automotive had wanted Burroughs to release all documents, letters and internal memos pertaining to the B800 computer and its software, but Burroughs demanded that the company specify exactly what material was necessary to be used in the scheduled trial. As a result, the trial — which was scheduled to take place March 11 in Twin Falls — has been pushed back to a later, as yet undetermined, date.

However, because of the judge's recent ruling, Burroughs must now give Century Automotive nearly all the information it originally requested.

"What Burroughs was trying to do was throw disk drives, CRT screens and line printers and everything else into the debate to confuse the issue with the term 'hardware configuration,'" Garry Oliver, Century Automotive's president said when contacted last week. By physically bringing a computer into the court room, the small firm finally managed to con-

(Continued on Page 8)

Politics of Computing City DP Seen Eroding Democracy

By Brad Schultz
CW Staff

IRVINE, Calif. — Local government computing is "inherently undemocratic," reinforcing a city's dominant political coalition and excluding "many legitimate interests," according to a recent research report.

Computers have improved the work conditions of some city employees in the U.S., but have generally led to "pervasive problems" in the operation of local government agencies, it said, adding that DP applications in those agencies tend to support internal administration, not service delivery to citizens.

And there is mounting evidence that systems implementation has made municipal agencies more costly to run, less responsive to the public and less equitable in meeting the needs of particular population groups, the report added.

Those charges refute the conventional wisdom on government computing, which holds that systems necessarily make agencies more efficient and decisions on their administration more "rational." But the charges are supported by the most exhaustive study of how computing affects the quality of local government yet con-

ducted — an on-site investigation of 42 U.S. cities considered representative of the full mix of American local governments.

The study by the Urban Information Systems (Urbis) Research Group of

the University of California at Irvine's Public Policy Research Organization (PPRO) is documented in a forthcoming book entitled *Computers and Politics* — a sequel to *The Management of* (Continued on Page 6)

Wanted: Women in High Places

By Rita Shoor
CW Staff

WASHINGTON, D.C. — It is a good time to be a woman if you are an upwardly mobile technical specialist and you want to work for the federal government.

That is the story from Donna Sandak, currently the chief of management information and administrative systems at the Federal Trade Commission (FTC) here.

Right now, "it's highly desirable in the FTC to have women in high positions," she said. Describing the agency as "committed to change," she noted that more women are getting into DP and law. Since these are the specialties which lead to positions such as assistant director at the various FTC bureaus, more women will be rising into these

important roles, she predicted. However, the FTC is a long way (Continued on Page 4)



Donna Sandak



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Honeywell to Hike DPS Lease, Rent

WALTHAM, Mass. — Honeywell, Inc. last week announced that it will raise the monthly lease and rental prices by up to 11% on its DPS large-scale computers and selected peripherals of the Level 66, 68, 62 and 64 DPS and non-DPS computer series.

At the same time, the company also reported that it will increase the monthly lease charges for its Page Printing System I (PPS I) and Page Processing System II (PPS II) by between 5% and 18% while boosting maintenance service charges on the

two systems between 10% and 18%.

Inflation and the spiraling costs of labor were cited as reasons for the recent pricing boosts.

All of the price changes become effective April 1 for new business, June 1 for existing contracts, or according to existing contractual limitations and price protection provisions, a spokesman stated.

The price increases on the DPS systems will be based on total system configurations, rather than on a single processor basis. While peripherals that are aimed solely at the firm's Level 66, 68, 62 and 64 computers are not affected by the price increase, those peripherals that can be used with these systems and the DPS computers will cost more to rent or lease, the spokesman continued. These peripherals include the DPS 8 mass storage processor and a number of disk drives, line printers and tape units.

Last week's announcement marks the second time this year that Honeywell has boosted prices on its DPS series line. In January, the firm raised DPS purchase prices and maintenance fees from 5% to 15% [CW, Feb. 2].

Cullinane Adds Development Aid

WESTWOOD, Mass. — Cullinane Database Systems, Inc. here introduced an application development system (ADS) claimed to up programmer productivity a maximum of 90% over "conventional programming languages."

The announcement marks the formal introduction of one of the components tying application software to Cullinane's Integrated Database Management System (IDMS). This integrated concept was first discussed by president John Cullinane during a press conference last fall [CW, Oct. 20].

ADS/Batch reportedly enhances programmer productivity by eliminating repetitive coding and by standardizing error checking. Maintenance programming time is reduced since changes are defined to the system on a one-time basis, according to a firm spokesman.

Transaction file validation and updating the IDMS data base are simplified because the package stores the transaction file format as a central resource to be shared by all applications, he explained. This means that file format modifications are made just once via Cullinane's integrated data dictionary (IDD). After that, the modified format is available to every application through the IDD, he said.

Adding ADS/Batch to the IDMS environment means that applications routines need only contain the logic re-

quired for special processing — and this logic would be written in the "simple language" provided with the package, he said.

Additional product features include:

- Automatic editing using a data dictionary to separate editing definitions from edit processing.

- Automatic transaction file error checking and 16 checking features.

- Dictionary communication that provides all data base control and compiler-directive statements.

- Run-time reports of transaction activity and errors.

Available for general release in spring 1981, the license fee for ADS/Batch is \$20,000. Cullinane is headquartered at 400 Blue Hill Drive, Westwood, Mass. 02090.

Sperry Univac to Cap Level 37R2

NEW YORK — Enhancements to Sperry Univac's Level 37R2 executive software will be discontinued after Jan. 1, 1986, according to a Univac spokesman.

The decision to "cap" or discontinue those enhancements will affect Univac users with hardware series 1100, 1106, 1108, 1110, 11/10, 11/20 and 11/40.

The decision stands in contrast to Univac's previous policies, which allowed older applications to run on new systems, the company said. Univac added that the point had come in the

development of series 1100 hardware and software where the company must make changes to ensure future user needs, such as functionality, stability, reliability and maintainability, at minimum cost.

"Future levels of the 1100 executive software beginning with executive level 38R1 will be written specifically for the newer, more efficient hardware of the 1100/80, 1100/60 and future systems and will not operate on any earlier series models," according to a Univac spokesman.

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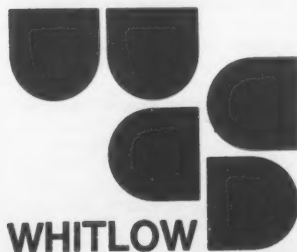
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COMPUTER SYSTEMS Inc. 560 Sylvan Ave., Englewood Cliffs, N.J. 07632

NEWS FLASH

Only a few short years ago, SyncSort was a struggling young performer trying to find work at fraternity dances, county fairs and chowder-society meetings.

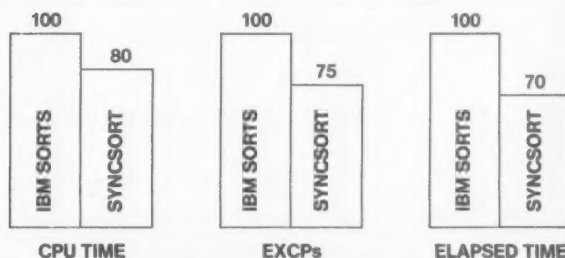
But last night, as millions of TV viewers watched, SyncSort was called to the stage three times to receive the top awards of the American Academy of Sorting Arts and Sciences.

Clutching his three "Golden Softies," the Englewood Cliffs (N.J.) resident delivered an emotion-packed speech in which he said: "I want to thank my mother, my father, and over 5,000 SyncSort fan clubs around the world. Without their loyal support, I'd still be out there riding the tracks. Nobody has to tell me that there's a broken heart for every light on Broadway!"

* * * *

Well, naturally, we're proud that our brainchild did so well. But as the program's business manager we'd like to add a few sober-sided comments that may explain SyncSort's tremendous box-office appeal:

1. BEST PERFORMANCE. Ever since SyncSort was knee-high to a grasshopper we had it competing with the sort programs marketed by a local hardware merchant. Today, SyncSort is simply the most efficient OS or DOS sort available. Compared to IBM sorts, SyncSort will give you resource savings that look like this:



2. BEST PROGRAMMER PRODUCTIVITY. We always hammered it into SyncSort's head that a programmer is a sort program's best friend — next to his mother, of course. As a result, SyncSort is loaded with "courtesy features" to reduce coding, compiling and debugging:

- INCLUDE/OMIT — chooses records to be sorted.
- SUM — summarizes designated numeric fields.
- INREC/OUTREC — reformats records on input and output.
- OUTFIL Report Writer — produces reports with headings, pagination and dating.

3. BEST TECHNICAL SERVICE. Right from the moment SyncSort went out onto the stage for the first time, we made certain that our performer was backed by some of the best technical accompanists in the business. Today, 85% of all requests for technical service are resolved in less than 24 hours.

Massachusetts Slaps 5% Tax on Software

By Marguerite Zientara
CW Staff

BOSTON — The Massachusetts Department of Revenue last week filed a new software regulation that will tax packaged software across the board and custom software in virtually every instance.

The regulation which will add 5% to

final rule requires the cost of modification to equal only 50% of the cost before modification.

While that change "is in the direction the computer industry wants us to go, we're told it makes very little practical difference because it's almost never the case that programs are transferred in human-readable form," Donovan

Arizona, Colorado, Florida, Louisiana, Minnesota, New Jersey, New Mexico, New York, Ohio, Rhode Island, Texas, Vermont and Wisconsin.

Fight to Continue

While the regulation is now past the point where more public hearings could be held on the matter, and reportedly could only be challenged through the courts, there are factions within the industry that plan to continue the fight.

"The industry is not going to be fufaloed. We're going to look at the alternatives available to us and to the industry in general," reported Steve Vajda, chairman of the Data Processing Management Association's (DPMA) software sales tax subcommittee, a group that has lobbied successfully in a number of the exempted states.

One possible avenue of relief is a bill recently introduced into the state legislature by Sen. Samuel Rotondi (D-Winchester), vice-chairman of the Legislative Committee on Taxation, that would exempt software from the state's 5% sales tax.

According to *Computer Law and Tax*

Report Editor Bob Bigelow, who helped draft the bill, "I thought the legislature should consider whether it wished to tax software. That determination should be made by the elected representatives of the people and not by the guys sitting there behind desks in the Revenue Department, especially in view of the fact that every court that has considered the question has held the [tax] in contention."

Even if the bill is ultimately passed, however, it could be "sitting in the Massachusetts Senate, or whatever, for another year [while taxes are levied and paid], and [the bill] may come out of the legislature in a form unfavorable to the industry by the time it actually is drafted into law," Vajda speculated.

Complicating the matter in Massachusetts is the passage last November of the tax-cutting Proposition 2½, the detrimental effects of which are beginning to be felt acutely across the Commonwealth.

Reliable projections on potential state revenues to be gained from the software tax are not available, but some observers have set figures as high as \$100 million.

the cost of such products, becomes effective Thursday.

The regulation differs from the original proposed rule in two ways: it does not tax time-sharing services and it distinguishes between canned and custom software, according to Joe Donovan, tax counsel for the Department of Revenue.

As the rule stands, canned programs transferred on tangible media will be taxed in every case, and custom programs transferred on tangible media will be taxed when transferred on machine-readable media, as opposed to being in human-readable form, Donovan explained.

Modification Cost

The original proposal defined "custom program" as one in which the cost of modification equalled 100% of the cost before modification. However, the

said.

Asked why the department did not heed testimony from the computer industry given at public hearings since 1978 [CW, Jan. 8, 1979; Sept. 8, 1980] in its promulgation of the software tax rules, Donovan noted, "We just looked at the Massachusetts statute and we looked at the way other state statutes have been interpreted, and this is the interpretation we came up with."

When reminded that a number of other states have exempted the same software packages from sales and use tax, Donovan responded, "That's right, but from the latest information we saw, there are roughly 20 states applying the interpretation we have in the regulation."

The 14 states that have exempted software from taxation, either legislatively or judicially, are Alabama,

Opportunities Said Awaiting Women in High DP Places

(Continued from Page 1)

from its goals with just two women representatives currently among the 30 assistant directorships within the bureau.

Sandak, who is slated to become a deputy director at the agency, has a lot of experience in being one of the few women executives in management information systems (MIS).

In 1971, her first job in the field involved developing the mathematical formulas required to automate the Federal Bureau of Investigation's fingerprinting system. She was "the first pro [the FBI] ever hired." Essentially, everyone else at the bureau was either a clerk or an FBI agent, she said.

The FBI brought in a programming team and some outside contractors, but the fingerprint automation has yet to be completed, according to Sandak. The FBI will not go to the automated system until they get 100% accuracy on the computer, she explained, claiming that the bureau has never been wrong with the manual system.

After two years of working with fingerprints, she went to the Action volunteer agency as a management information specialist for domestic operations. This job provided her with her first exposure to administrative management, with five people reporting to her. She functioned as an interface between the end users and the programmers — a liaison position that is often a necessary step along the career path to administrative management.

Sandak joined the development effort to develop a data base management system (DBMS) for the agency. The team had come up with an agency-wide personnel system and was ready to put terminals into the regional offices when ex-president Carter's administration, in her words, "squashed the whole thing" and reassembled the entire group to the Com-

puter Services Division.

She wound up as special assistant to the DP director of the FTC in 1979. Since the job put her in charge of rather nebulously termed "special projects," she was supervising changing groups of people.

Eventually, she replaced the manager of one of these projects and then moved into a supervisory spot with a charter to redo the FTC's commissionwide management information system. Assuming that the system is implemented on schedule, Sandak will take up long-range planning for the agency sometime after March.

Constant Pressure

Although her current position involves managing some 15 people in-house and includes all administrative responsibilities for outside contractors, Sandak did not receive any formal management training from either Action or the FTC.

It does not appear to have affected her career except in a positive fashion. There was always "pressure to do well because I was the only woman," she recalled. While the competition has remained as she moved through the bureaucracy, she maintained things have become more comfortable.

"Men don't mind working for a woman," she found. She has proceeded to prove that point by running two small businesses — a locksmith shop and a microfiche service bureau, with as many as 30 subcontractors reporting to her — in addition to her work at the FTC.

Contrary to opinions expressed by the more rampant feminists, women should not manage in the same way a man does, according to Sandak. A female manager "does not have to walk heavy and rant and rave" in order to command the respect of her subordinates.

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DOS/VS Usage Down 20% Large IBM Users Seen Migrating to MVS

By Rita Shoor

CW Staff

WALTHAM, Mass. — Large IBM installations are overwhelmingly moving to MVS operating systems while DOS/VS usage has dropped some 20% since 1978, according to a survey released by International Data Corp. (IDC) here.

Reporting in the "IBM Software Environment" is based upon the software used on selected 360, 370, Series 30 and 4300 CPUs in 751 sites throughout the U.S. Besides examining operating system distribution, the survey includes data on access methods, data base management systems (DBMS), query language capabilities, in-house time-sharing facilities, program development, programming languages and the teleprocessing (TP) monitors utilized at these sites.

Survey responses indicated some significant trends among the IBM user base, IDC noted. An overall growth in MVS use and a definite preference for IBM's CICS among shops with TP monitors were immediately apparent. Some 14.4% of all IBM users were running MVS at year-end 1979 compared to 12.8% in 1978. MVS usage was particularly high among large-CPU sites, IDC noted, with 91% of the 370/168s and 89.8% of the 3033 sample opting for this environment.

Further evidence of increased MVS usage is indicated by the fact that it more than doubled in the Series 30 family over a two-year period, according to the report. In 1978 just 24.8% of these installations were running MVS, compared to 53% reporting its use by year-end 1979. Users with plans to migrate to Series 30 mainframes are also planning to run MVS, IDC said.

The market research firm speculated that this move to MVS can be attributed to two factors. In addition to being "spurred on by strong inducements from IBM," it may be an indication that this operating system is "viewed as an important bridge to a new system architecture."

Communications Software

Communications is moving to the forefront with approximately 72% of the CPUs requiring communications software. That figure represents some 10,400 TP monitors running on the IBM mainframe sample, IDC said. The definite leader in this area is IBM's CICS, which captured over 71% of the market share.

The only exception to this plurality was among 360 users. Westi, from Westinghouse Electric Corp., came in first among this group with 30.1% of the low-end users installing this monitor, as opposed to 23.4% using CICS, according to the survey.

Although DOS/VS is still the most widely used operating system among 370 users, with more than 58% of the respondents running it, this figure represents a drop of four percentage points over the previous IDC survey. The firm attributed this decrease to a switch to DOS/VSE at 370/115 and 370/148 sites.

IBM 360 installations again ran counter to the general trends by showing an increase in ten percentage points over the approximately 58% with DOS/VS systems running year-

end 1977, IDC said.

Vsam is the preferred access method on IBM's general-purpose mainframes, the report continued. Over 53% of the respondents chose this method, with Isam managing to retain a share of just under 37%.

However, when looking at specific CPU families, Isam remained the choice of 360 users with 73.9% of this group running this software. In contrast, well over half of the 370 sites opted for Vsam, and some 65% of the 4331 users made the same choice, the report continued.

Another proof of the move toward more communications networks is evidenced by nearly 60% of the entire

sample operating with telecommunications access methods at the end of 1979. Just 46% of the overall sample utilized this component two years earlier, IDC observed. Basic telecommunications access method (Btam) was the choice of 61.7% of the respondents. But, virtual storage telecommunications access method (Vtam) usage is on the rise with some 31.4% of the market — a considerable increase over the 16.2% reported in IDC's previous study.

DBMS Demand

DBMS demand remains strong and the research firm predicted accelerated growth in terms of revenue and new

product development for the next decade. Just under 38% of the IBM installations had DBMS software installed at the end of 1979 and more than one-half of these users (60.6%) had either IMS or DL/1 running, according to the survey.

Despite IBM's current dominance in this area, IDC saw this market as highly competitive for independent suppliers, with vendors of IBM-compatible software accounting for almost all of the remaining installed DBMS.

Copies of the "IBM Software Environment" survey are available for \$2,500 from IDC at 214 Third Ave., Waltham, Mass. 02154.

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Report Covers PCM, IBM Users On Satisfaction

(Continued from Page 1)

IBM's 370 and 4300 lines came in second with 3.4s, followed by NAS and Magnuson processors at 3.3 and CDC with 2.7.

IBM peripherals were rated higher than the plug-compatible manufacturers' (PCM), however CDC (rated at 2.5) is the only one making a serious effort to develop IBM-compatible peripherals.

Maintenance Ratings

In the maintenance response category, Amdahl, CDC and Magnuson were all rated higher than IBM; NAS was rated about equal with IBM. Users pointed out that maintenance response was better on IBM's 4300 and 30 series than on the company's 370 series.

Amdahl and Magnuson were rated

Features	Amdahl	CDC	Magnuson	NAS	IBM 370	IBM 4300	IBM 30 Series
Ease of Operation	3.6	3.5	4.0	3.6	3.2	3.5	3.0
Reliability of Mainframe	3.7	2.7	3.3	3.3	3.4	3.4	3.3
Reliability of Peripherals	3.1	2.5	3.0	2.7	3.1	3.2	3.2
Responsiveness of Maintenance Service	3.5	3.5	4.0	3.3	3.0	3.3	3.3
Effectiveness of Maintenance Service	3.4	2.5	3.7	3.1	2.8	3.1	3.1
Technical Support	Trouble-shooting	3.1	2.2	3.7	2.9	2.6	3.0
	Education	2.8	2.3	3.7	2.7	2.8	2.8
	Documentation	2.9	2.2	3.7	2.8	2.7	2.8
Operating System	3.1	3.0	3.5	3.3	3.1	3.4	2.9
Compilers and Assemblers	3.2	3.0	3.5	3.3	3.2	3.5	3.2
Applications Programs	3.0	3.0	3.5	2.8	2.8	2.8	2.8
Ease of Programming	3.4	3.2	3.5	3.2	3.0	3.1	3.0
Ease of Conversion	3.5	3.2	3.5	3.4	2.9	3.4	3.0
Overall Satisfaction	3.6	2.8	3.5	3.2	3.1	3.1	3.1

Figures Courtesy Datapro Research Corp.

User Rankings

most effective in handling maintenance problems, while IBM and NAS were virtually tied. CDC's maintenance effort was rated lowest by those surveyed, the report said.

In the area of technical support, Am-

dahl and Magnuson were again rated over IBM. NAS scored slightly less than IBM, and CDC was rated last in this category.

Under ease of programming and ease of conversion, all the PCMs rated

higher than IBM, with the 370 line and the 30 series scoring the lowest rating, Datapro said.

The Datapro report costs \$15, the firm said from 1805 Underwood Blvd., Delran, N.J. 08075.

Book Says Municipal DP Eroding Democracy

(Continued from Page 1)

Information Systems, which in early draft formed the basis of a series of *Computerworld* articles in 1979.

"We believe that these negative impacts on citizens are attributable to the conservative and elite-dominated politics of computing in organizations," charged the authors of *Computers and Politics* in a draft made available to CW. "We are disturbed because the dominant political coalitions have failed to utilize computing to serve citizens," they wrote, "in new ways that utilize the technology's potential."

According to the PPRO researchers, "computing has rarely been used to enhance citizen participation in government, to inform citizens of their rights . . . and duties and to provide new information services to citizens."

The Urbis book challenges the notion that computer technology is an apolitical tool. This notion is characteristic of the "rationalist perspective" on government computing, which implies that computers should serve the organization as a whole and be controlled by top managers, who alone have the

breadth of vision necessary to guide utilization toward satisfying the organization's collective interests.

As the dominant perspective on government computing, the rationalist perspective is grounded in a classical model of administration, the researchers noted, and in the concepts of scientific management. The Urbis findings thus run counter to the way many professional city administrators have been taught to do their jobs.

Skewed Data Bases

When these administrators focus on such topics as optimal design of management information systems, the benefits of on-line computing, the value of user involvement in design or the pay-offs of automated systems, they do not focus on improving the quality of government service to citizens, the researchers indicated. Instead, those topics involve methods for streamlining certain government operations — which may or may not benefit the public.

Managers in local government often do not employ computers to satisfy the collective interests of the organization

in which they work. Some top managers use computing to reinforce their influence over top elected officials, Urbis found, by maintaining data bases that lend credence to their positions on public policy.

The elected officials, on the other hand, and citizens groups that might lobby against certain policies commonly lack comparable levels of computing resources. They are outgunned.

An alternative to the rationalist perspective on local government computing was termed "technocratic elitism" in the Urbis study. This view holds that top managers do not, and often should not, control computing decisions in organizations.

Instead, technocratic elitism maintains that computing should be largely controlled by experts in the technology because only they know how to use the technology most effectively.

But critics of technocratic elitism contend that experts, given the chance, use control of computing resources to serve their own interests.

Another perspective on local government computing was termed "organizational pluralism." This holds that various groups — politicians, administrators, technocrats and line professionals — can all work to influence how government applies computer technology.

"It is assumed that the pulling and hauling among contending interests within the organization will tend to yield decisions and outcomes that merge alternative views into a composite [that better fits] the public interest than any particular actor's position," Urbis observed.

The mayor of a city might, for example, view an automated welfare case tracking system as a means of thwarting welfare cheaters. But the city's welfare department head might view the system as a means of monitoring the performance of case workers; the case workers, in turn, might see it as reducing their paperwork in handling welfare recipients.

Taking this example, technical experts might work with all these actors in designing a system that would be a "reasonable compromise" of their respective concerns, according to the or-

ganizational pluralism perspective.

Critics of this view argue that such a compromise may wind up satisfying no one, Urbis noted.

The on-site investigations of 42 cities gave Urbis little support for the rationalist perspective, some evidence that technocratic elitism and organizational pluralism ably describe certain situations, but an overall impression that the perspective best supported by data, fieldwork and analyses is a view termed "reinforcement politics."

More on that in the next article of this series.

Series to Cover Urban Systems

This article is the first in a series on how computing affects the quality of local government, based on research conducted by the Public Policy Research Organization's (PPRO) Urban Information Systems (Urbis) Research Group. This research will be published as *Computer and Politics* by Columbia University Press.

Principal authors of the book are James N. Danziger, William H. Dutton, Rob Kling and Kenneth L. Kraemer. Dutton is with the University of Southern California's Annenberg School of Communications. The others are with the University of California at Irvine.

Columbia University Press has just released *The Management of Information Systems*, which in draft form was covered in a series of *Computerworld* articles two years ago [CW, Jan. 29, Feb. 12, March 5, April 9, 1979]. Information on that book, written by Kraemer, Dutton and Alana Northrop and offered for \$25, is available from the publisher at 562 W. 113th St., New York, N.Y. 10025.

For more information on PPRO and the Urbis project, Kraemer can be reached c/o PPRO at the University of California, Irvine, Calif. 92717.

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Former Counsel Refutes Analysis Of Bell Case

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — The former chief counsel for the Justice Department trial staff, which is prosecuting the government's antitrust case against AT&T, took "vigorous exception" to a March 17 *Computerworld* article indicating that the phone company is likely to win the case.

The story, based largely on an interview with a former member of the Justice Department's Antitrust Division, said a recent adverse decision by Judge Harold H. Greene reflected his continuing irritation with the government's presentation of its case; the decision also reflected on the ability of the trial staff to keep up with the fast pace of the trial.

The source added that "the longer the trial goes on, the more competitive the telecommunications industry becomes and the weaker grows the government's request for divestiture of the Bell System's key components."

Kenneth Anderson, the former chief counsel who is now in private practice, contend that Judge Greene's alleged "irritation" merely reflects his desire to complete the trial as quickly as possible.

"He nags both sides constantly, so nobody gets bad habits," Anderson said. Asked why most of the nagging to date has been directed at the Justice Department, Anderson said it's because the government's case is being presented first.

Anderson is concerned that Congress will try to pass a communications act rewrite bill this year similar to the measures considered by the House and Senate last year. Those bills required AT&T to market certain services and products through separate subsidiaries instead of divesting itself of key components of the Bell System as demanded by the Justice Department in its antitrust prosecution.

The House bill did not pass mainly because the House Judiciary Committee felt such action would affect the outcome of the trial. "That's still a possibility," Anderson said.

The only justification for Congress to act before Judge Greene reaches a decision is if the trial drags on, he added. But that "isn't going to happen." The trial is "going so fast that both the government and AT&T are likely to complete their presentations by this fall." Also, there may not be a separate proceeding on the question of relief, "which would telescope the case further. With that speed, there really isn't a need for legislation; it would be a waste of congressional resources," Anderson contended.

"Congress would be better off waiting for the decision, after which it could consider the need for modifications," he added.

Although there may be signs that AT&T is willing to compete fairly, he said, "the company's new posture will last only as long as the trial does. The big question is whether Bell will voluntarily forego exploiting its monopoly afterward. The government's case, by the time it's completed, will show conclusively that the separate subsidiary scheme won't provide an adequate guarantee."

IBM Expands Low End of 3705 Controller Line

WHITE PLAINS, N.Y. — IBM has expanded its 3705 line of communications controllers by announcing three low-end models designed to handle data transmission in smaller networks and remote facilities in larger networks.

The announcement raised questions among industry analysts about when IBM would announce the 3705 replacement. Analysts had originally thought that replacement would be announced within six weeks, however some are now saying it may be the third quarter of this year.

The new 3705 models, called 3705-M81, M82 and M83, offer 256K characters of storage and are available in four-, 10- or 16-line

versions. The controllers will accept line speeds up to 9,600 bit/sec using standard attachments with start/stop, binary synchronous or synchronous data link control line protocols. By using an upper scan limit facility, users can attach up to eight synchronous lines that can operate at up to 19.2K bit/sec on the 16-line M83, IBM said.

Line Set Features

The four-line M81 and the 10-line M82 offer special line set features that allow use of an autocall control feature, an interface to support line speeds up to 56K bit/sec, a wide-band interface that offers line speeds up to 50K bit/sec or a high-speed direct interface that supports

line speeds up to 57.6K bit/sec, IBM said.

The 3705 M80 line supports current 3705 software and can be attached to 4300 as well as 370 and 30 series processors, IBM said.

First customer shipments of the M81 and M82 are scheduled for the second quarter of 1981; the 16-line M83 will be available in the third quarter of 1981.

The M81 with channel adaptor costs \$39,940 or \$1,314 per month on a two-year agreement. The M82 including channel adaptor costs \$49,940 or \$1,679 on a two-year lease. The 16-line M83 with channel adaptor costs \$55,940 or \$1,954 per month on a two-year agreement, IBM said.

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Burroughs Told to Release B800 Data — Again

(Continued from Page 1)

vince the judge of exactly what it wanted from the Detroit-based vendor. But, "We had a hell of a battle," Oliver admitted.

"We're going to start digging on them now," Oliver added, "requesting one or two documents that we know

exist."

Burroughs has reportedly agreed to supply the firm with any documents that could be specifically described and that have a relationship to the Century Automotive case.

Century Automotive filed suit against Burroughs nearly three years

ago, claiming that a B800 computer system sold to the company never performed as the salesman promised. Since then, the two companies have been locked in a sometimes heated battle over who is responsible for the inoperable system and who should be responsible for losses caused by the system's alleged shortcomings.

The automotive firm's legal shove recently picked up steam when a number of other users across the country filed suit against Burroughs for relatively the same problem — that the B800 and B80 computer systems were allegedly oversold. Recent estimates put the number of lawsuits pending against the beleaguered vendor at more than 100, with more users adding to the legal fire every week.

Century Automotive was the first user to actually have a date set to meet Burroughs in court with a jury trial.

To combat the flurry of user criticisms about the B800 and its sister systems, Burroughs in the past few months initiated a well-planned campaign to promote the machine in the eyes of future and present users. As a part of this campaign, salespeople were armed with glowing testimonials

on the B800, the trade media was peppered with satisfied user case histories, and even video tapes were reportedly prepared to boost the computer system's sagging image.

However, Oliver and a number of other disgruntled users have a different outlook on Burroughs and want more than case histories and films to be convinced of the company's sincerity.

"Those guys have been doing nothing but giving me a bad time out here," Oliver continued. "If Burroughs wants to play the lousy game that they're playing, I'll get down and play with them."

Oliver does not reserve his less than flattering comments just for Burroughs, but argues that overzealous sales tactics might be a part and parcel of the whole computer sales business.

"Burroughs is taking the brunt of what has been wrong with this whole industry for the last 10 or 15 years," Oliver said in an earlier interview, quoting what he was told by a computer salesman friend. "Maybe they're a little bit more guilty than most, but every vendor has done the same thing at one time or another."

Intel Beefs Up System 2000 In Line With User Requests

(Continued from Page 1)

user organization.

5. String password authority, which would restrict users to strings only and bypass the assignment of item authority when this is part of a string.

6. Plex text search, including concatenated keys, plex where this goes beyond first key position and also 78011.

7. Dynamic construction of where clause, which would increase flexibility for plex.

8. Increased number of derived names in report writer, which currently is limited to 62.

9. Multiple data base access, which would provide for data base integration.

10. Automatic data validation, which would make the DBMS responsible for data values tables (edit and translation range).

The last item was submitted by Intel itself, in recognition of a strong industry trend regarding validation, according to Mike Dion, product manager for Intel's OS and VM/CMS systems.

Dion said item nine, multiple data base access, is currently in design at Intel. The company is evaluating number eight, the possibility of increasing the number of derived names in report writer, he said.

Regarding the seventh item, dynamic construction of the "where" clause, Dion said that a technique does exist which can satisfy, if not completely

solve, user needs. He encouraged those experiencing problems to contact Intel for this information, noting that the company is not planning to work further in this area.

Dion said that this method of having users vote on enhancements they would like to see is the best way Intel can obtain feedback regarding its products.

He said that once the most pressing needs are defined and determined reasonable, Intel implements the proposed solution at the installation of one of its customers who is experiencing the problem.

Polish DPer Caught Up in Labor Fight

(Continued from Page 1)

publicity in the international arena as the first independent trade union in a communist society. Also in line with some of the objectives of the "Solidarity" movement, the DP workers union regards as its first priority a demand for an increase in wages and salaries for DP workers in Poland. They also take the view that all DP workers throughout the country must be treated equally.

The incipient trade union promptly attacked and criticized the top management echelons in Poland's DP industry. In the opening paragraphs of a position statement published by *Informatyka*, the union pointed out that too

often DP managers in Poland are political appointees without adequate training in data processing whose activities are only a stumbling block to the smooth operation of computer enterprises.

The union statement referred to this situation as the "bureaucratic-camaraderie style and climate of management" highly inappropriate to the complexities of the computer industry.

Some of the points in the union's plan of action also call for extensive changes in various work and employment procedures in the industry. For example, they want to liquidate the harmful practice of establishing employment quotas on the basis of previous year levels. They propose that DP workers be assured jobs that are commensurate with their qualifications. They want to participate in establishing work and pay scales in the future.

They also insist that wage and salary differences for DP workers that apparently exist between different enterprises and industries be eliminated. This reflects the fact that workers such as programmers or operators are primarily regarded as employees of the industry branch in which they happen to operate computers and not as members of a separate industry.

It is interesting to note that in many Soviet Bloc countries computer workers are primarily regarded as employees of the industry which they serve in whatever capacity this happens to be.

In the Soviet Union, for example, there are no computer trade publications even such as *Informatyka* in Poland, although there are several technical journals dealing with automation and computer applications. In many cases computer specialists are classified as engineers or mathematicians who happen to be experts in use of computers.

Poland's DP trade union also plans to

get into the act of improving the country's economy by suggesting development of software systems that solve real problems rather than those mandated by undefined authorities within the industries involved. They propose that sales of such software systems should take place on a competitive basis with credits (and presumably performance responsibility) being clearly identified with respective authors and implementors of those systems.

Role Clarification

In a complementary statement delivered to the Ministry of Science, Higher Education and Technology, which centrally controls data processing development in Poland, the new DP union requested clarification of the role of DP in Poland's economy. They feel entitled to government explanations for the failures to data of DP policies pursued in Poland and they want to know the status of the DP hardware, software and international cooperation programs of the Polish computer industry.

The union also wants to know about proposed reforms in Poland's computer industry, and more specifically when and how much DP workers will receive in additional wages for working during the second and third shifts.

Poland's DP workers' union clearly has its tasks laid out, but already it is under fire thanks to the very same freedom of organizing labor in the industry. It now appears that several trade unions and more professional associations and societies are claiming to be the true representatives of Poland's DP workers. They are each trying to attract computer specialists of all types to their own ranks and build up membership.

To date confusion reigns in a computer industry that has been in turmoil for some time and even some industry leaders are now beginning to ask themselves what to do next.



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Report Confirms Industry Charges Carter Accused of Hushing Contract Act Report

By Jake Kirchner

CW Washington Bureau

WASHINGTON, D.C. — The Carter administration suppressed for almost two years an interagency study confirming industry contentions that the Service Contract Act is highly inflationary, a leading Senate Republican has charged.

The law, recently applied to federal DP services and maintenance contracts over the objections of industry groups such as the Computer and Business Equipment Manufacturers Association (Cbema), compels contractors to pay employees minimum wages determined by the Labor Department.

According to Cbema, the 1965 law, originally intended to protect the wages of blue-collar service workers, should not be applied to relatively high-salaried workers, such as computer service technicians and programmers. To do so would disrupt industry merit pay plans and drive companies from federal bidding and thus threaten government DP capabilities, Cbema said. [CW, Feb. 2].

In making the Carter administration study public, Sen. Orrin Hatch (R-Utah) said the Carter White House refused to release it despite repeated senatorial requests. Hatch, chairman of the Senate Labor and Human Resources Committee, said the report was recently obtained from David Stockman, the new Office of Management and Budget (OMB) director.

The 19-page study analyzes a series of proposed regulatory changes to the administration of the Service Contract Act and another controversial wage law, the Davis-Bacon Act. The study concluded the proposed changes "could reduce federal expenditures on the order of \$1.9 billion and the inflation rate by .285 percentage points."

Waiver Refused

Despite that conclusion and despite a recent General Accounting Office report protesting extension of the Service Contract Act to federal DP contracts, the Carter Labor Department steadfastly refused to give DP and other high-technology industries a waiver of the law.

In the face of this Labor Department intransigence, several DP firms balked at signing federal contracts that would bring them under the law's jurisdiction. Cbema and other industry groups have continued to seek administrative or legislative relief from the Act's provisions.

Discussing the controversy, Hatch said, "the study took a very critical view of the prevailing wage laws and it's been suggested the Carter administration stonewalled the report for fear of incurring the ire of union leaders."

Indeed, the report said "the Labor community is incensed over the fact that a Democratic administration would undertake such a review of basic labor protection laws."

According to Hatch, the interagency task force was headed by the Office of Federal Procurement Policy and comprised Labor Department officials and procurement officers from various agencies, including the Departments of Defense and Energy, the General Services Administration and the National Aeronautics and Space Admin-

istration.

"It's significant because it reflects the input of federal procurement officers,

and, as administered, do not accurately calculate the true prevailing wage in a given area."

'Despite a recent General Accounting Office report protesting extension of the Service Contract Act to federal DP contracts, the Carter Labor Department steadfastly refused to give DP and other high-technology industries a waiver of the law.'

from the agencies, who are charged with day-to-day administration of the law," Hatch said of the study.

"These officers confirm what industry spokesmen have said for a long time — the acts are indeed inflationary

The issue is due for congressional airing this spring, which has fueled industry optimism about a possible relaxation of the Service Contract Act regulations. Also, industry spokesmen have contended since the November

election that the Reagan Labor Department would be more sympathetic to industry entreaties on the subject.

That expectation was bolstered last month when Labor regulations, rushed through at the end of the Carter administration, to extend the law to DP and other high-technology contracts, were frozen as part of Reagan's general moratorium on new regulations [CW, Feb. 16].

Also, James Miller, OMB director of Information and Regulatory Affairs and a member of the Reagan task force on regulatory reform, said earlier this month he expects Labor Secretary Ray Donovan to act soon to reduce the industry's burden under the wage law.

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Battle Brewing Over Bell's Custom Calling II

By Phil Hirsch

CW Washington Bureau

WASHINGTON, D.C. — A major battle is brewing between AT&T and independent suppliers over a low-cost electronic message service called Custom Calling II.

The flash point came last week when AT&T asked the Federal Communications Commission (FCC) to let Bell operating companies across the country offer Custom Calling II. Vigorous opposition from independent terminal makers and vendors of on-line information services is virtually certain.

Significantly, two FCC commissioners publicly support the phone company and two others appear sympathetic. The commission has a total of seven members, but two positions are currently vacant.

Custom Calling II allows a telephone company customer to have incoming calls stored within the network when he is away from his home or office. When he returns, the customer can retrieve the accumulated messages by dialing a unique code. He can also store outbound messages and have them delivered at a specified time. Another Custom Calling II feature allows the customer to retrieve his accumulated messages or input messages for later delivery, when he is away from his own phone, by using any other telephone connected to the AT&T dial-up network.

No special terminal equipment is needed by Custom Calling II subscribers; they can use any rotary or Touch-Tone telephone, and the rates are extremely attractive.

The first Custom Calling II tariff was filed several months ago by Pennsylvania Bell Telephone Co. It proposes to charge the customer 25 cents per day, plus 12 cents for each call received; alternatively, for \$12/mo, the customer can receive up to 90 calls.

At those prices, Custom Calling II not only competes with business-oriented electronic message services, but it also becomes feasible for resi-

dential customers — a market which other suppliers of electronic message services have not yet entered.

Nonvoice Service

Although Custom Calling II, at the moment, is a voice-based offering, it can easily accommodate low-speed data terminals that now operate on the analog telephone network. As the FCC pointed out last December in its Second Computer Inquiry decision:

"Technological advances are negating network differentiation of voice and nonvoice services. Customers can technically use Custom Calling II to store data now; as networks become increasingly digital, there will be no way to distinguish between voice storage and other types of information storage devices. Any enduring and workable demarcation between basic and enhanced services (must) exclude information and retrieval services — both voice and data — from the basic category."

Under the decision, Custom Calling II service is an enhanced offering which must be offered by AT&T through separate subsidiaries rather than through Bell operating companies. However, the decision also allows AT&T to apply for a waiver of this requirement "if state-of-the-art technology dictates that only through the use of network facilities could the carrier provide a given enhanced service, or if complying with the separate subsidiary requirement results in the imposition of unreasonable costs upon consumers."

AT&T, in its recently filed petition to the FCC, contended it would take "a minimum of three years" to redesign Custom Calling II facilities so the service could be offered by a "separate sub." Thus the commission's first criterion for granting a waiver is allegedly satisfied.

Regarding the second requirement — imposition of "unreasonable costs" — the phone company said the added expense of modifying Custom Calling II

so it could be offered through a separate subsidiary "would substantially increase" the price of the service and reduce demand below the point where costs could be recovered.

Not Convinced

Not everyone is convinced that these contentions are valid, however.

According to Jack Biddle, president of the Computer and Communications Industry Association (CCIA), one of the computer industry groups planning to oppose AT&T's waiver petition, "if it's really true that offering Custom Calling II through a separate sub would be that costly, it means that Bell operating companies, in order to offer a lower price, would have to use revenues from their other services to pay part of the costs. A major purpose of the Computer Inquiry Decision is to eliminate opportunities for such cross-subsidies."

"As far as we are concerned, AT&T's request for a waiver is nothing more than an attempt by the industry's elephant to extend her trunk beyond the boundary wall which the FCC created in the Second Computer Inquiry."

The Custom Calling II tariff, which Pennsylvania Bell filed several months ago, is the only one to surface so far, but AT&T has announced that several more of its operating companies are ready to offer similar services as soon as the FCC acts on the recently filed waiver request. That is one reason the

phone company's competitors are likely to launch an all out counter-offensive.

Also, Custom Calling II is one of a number of telephone company offerings that allegedly are dependent on the dial-up network for their effectiveness. Another is a videotex-based Electronic Information Service (EIS) which Southwestern Bell and AT&T are planning to test in Austin, Texas next June. Both the Texas Public Utilities Commission and the U.S. District Court in Austin are planning to hold hearings on EIS shortly, in response to objections from the Texas Newspaper Publishers Association and Datapoint Corp. One of the objections is that since no waiver has been obtained for the forthcoming trial, it cannot go forward without violating the Second Computer Inquiry decision.

FCC Commissioner Joseph Fogarty was among the chief architects of the waiver provision incorporated in last December's Second Computer Inquiry decision. He has made it clear that he believes Custom Calling II is a basic, not enhanced, service. Recently, another commissioner, Anne P. Jones, expressed similar sentiments [CW, March 23]. Two other commissioners — James Quello and Abbot Washburn — have expressed concern that the decision may have created unnecessary restrictions on the phone company's freedom to offer innovative services.

Datacomm Briefs

Users Request Rate Hike Delay

WASHINGTON, D.C. — Several telecommunications users have asked the Federal Communications Committee (FCC) to suspend a proposed 16.4% increase in AT&T's private-line rates beyond next May 14, the effective date proposed by the phone company.

The higher rates were proposed in February [CW, Feb. 23] after the FCC accepted a revised cost-allocation scheme which, according to AT&T, "substantially increased" the level of costs chargeable to private-line services. If the increases are accepted, they will enable AT&T to earn an overall 10.5% rate of return on its private-line services in 1981. This is the rate currently allowed by the commission.

According to the critics, however, the increases would enable Bell to earn a higher-than-allowed rate on some services and less than 10.5% on others.

"This situation presents obvious, unjustified cross-subsidization," observed the Ad Hoc Telecommunications Users Committee, made up of several large companies. "Some private-line customers should not be required to pay unreasonably high rates to subsidize other private-line customers."

The U.S. Government, GTE/Telenet Communications Corp., Citicorp, and the Aerospace Industries Association were among the other users who objected to the tariff.

A common theme in their petitions was that it is impossible to tell whether the proposed private-line rates are excessive, or will involve cross-subsidies, because several related proceedings have not been completed.

One of these involves AT&T's efforts to increase its authorized rate of return. Also, the phone company has filed a revised Wats tariff and has been trying for some time to terminate Telpak, its bulk-rated private-line service.

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Extensive Changes Expected DBMS User Planning Seen Gaining Importance

By Lois Paul
CW Staff

AUSTIN, Texas — Data Base Management Systems (DBMS) will undergo extensive changes within the next few years and planning and input from users will become increasingly important, according to Mary E.S. Loomis, Ph.D. at the University of Arizona.

"Users are a tremendously untapped resource," the keynote speaker said at the Association of System 2000 Users Technical Exchange (Astute) held here last week. "DP people are more and more going to be leaning on users to bear more of the burden of defining systems."

Loomis emphasized the need to prepare for changes in DBMS such as automated design aids, user-defined systems and data base-specialized hardware, viable distributed DBMS, application-specialized DBMS and decision support systems.

These potential changes address common problems with DBMS such as poorly specified requirements, labor-intensive design processes, general-purpose hardware and software, centralized solutions to distributed problems and fuzzy decision-making environments, she said.

Automated Aids

The solution of automated design aids would involve requirements statements and analysis aids that can assess the completeness, consistency and understanding of the systems, she said. It will be necessary to find languages to state needs, as well as analyzer software, Loomis said, noting that both of these exist and are being refined. These will help users better understand their needs, she added.

She described a possible method of developing prototype or "soft" systems that would promote user feedback on individual needs. A first cut of a system would be developed and the user's feedback during the process would assist further development of the system until a final version had been completed. The final system would ideally be more adaptable and flexible because the user had had the experience of living with the prototype, Loomis explained.

Describing the need for automated data base and development software aids, Loomis noted that "currently more than 60% of these are used for supporting what we are already stuck with."

She pointed to a greater than 20% annual turnover rate in DP shops as one indication of the necessity for making data base design aids more productive. "Already, users are designing their own systems, using natural language interfaces and ad-hoc query capabilities," Loomis said. These aids increase productivity by avoiding the middle step of bringing in the programmer.

Another component that will improve data base productivity is better hardware, Loomis said. She mentioned the need for data base machines, which she defined as processors specifically for data base handling through hardware, software or both. Data base machines would separate data base processing and applications processing, removing the former entirely from the

central host computer.

Loomis described three types of data base machines. The first is an intelligent controller that would provide more intelligence in the disk storage device and cut down on I/O from the host computer, while leaving the DBMS in the general-purpose host. Intel Corp.'s Fast 3805 is an example of this type of configuration, she said.

A second type would be a back-end data base processor. It would handle the DBMS in another processor, which could be a general-purpose computer with specialized software. The DBMS itself, however, would not be processed within the host general-purpose computer in this configuration.

Loomis said there could be multiple back ends on the same host computer or one back end serving multiple hosts

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At Astute

or multiple back ends and multiple hosts.

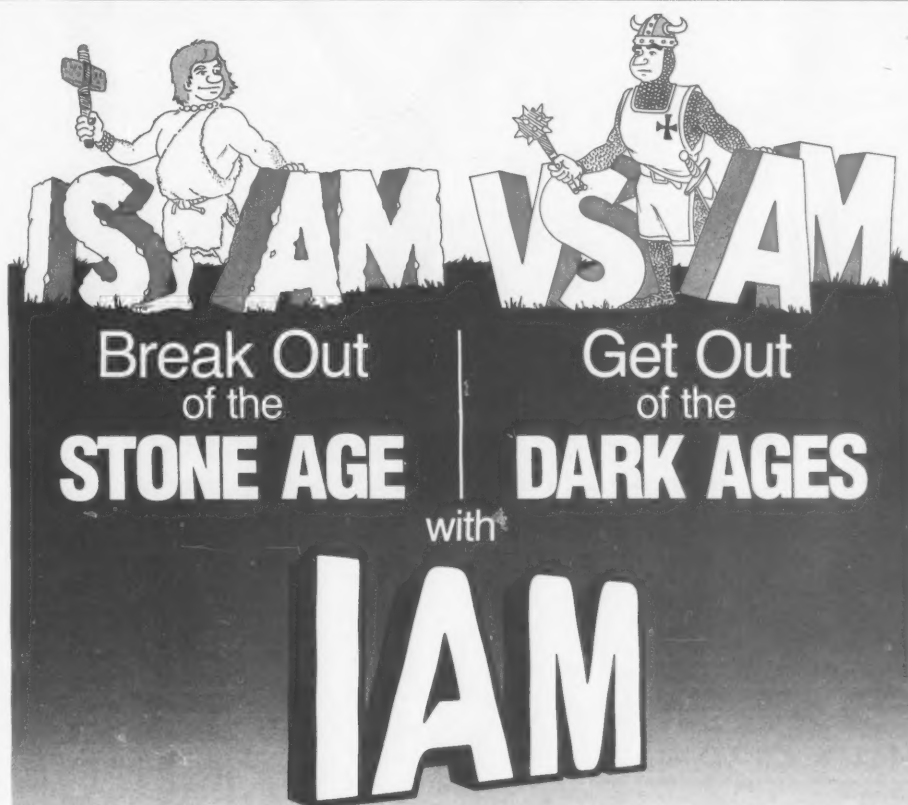
A network data base node is the third type of configuration. Here the data base processor would be remote from the host and interface to it through a communications network.

Loomis described distributed data

base systems as a solution to some of the current problems with DBMS. Distributed data base systems would enable sharing of data resources among components located at various sites within the network, some of which are integrated, she said.

With distributed data base systems, different components can be specified to do different kinds of jobs and communications costs can be controlled by localizing access, she said.

Distributed data base systems can have a horizontal distribution in which there is a peer relationship among the components or a hierarchical distribution characterized by a "master-slave" relationship, she added.



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Denmark Moving to Phase Out Paper Securities

By Lois Paul

CW Staff

AUSTIN, Texas — Intel Corp.'s System 2000 data base management system (DBMS) will enable financial institutions in Denmark to "burn eight billion U.S. dollars without losing one penny" and thus move that country one step closer to being the first to stop issuing paper securities.

The 200-man-year project, which should be completed by

1983, was described by representatives of VP-Centralen, a Danish security organization,

and bond certificates will be processed by VP-Centralen's computer accounting system,

CW at Astute

at the Association of System 2000 Users for Technical Exchange (Astute) conference here last week.

When the project is complete, all paper share, stock

according to Jens Bache, president, and Henrik Dines Hansen, director of systems development.

The new system was developed because of growing con-

cern in Denmark over the number of bonds in circulation. In 1980, 35 million bond certificates were registered in approximately 1.5 million safe-custody accounts.

A law passed by the Danish parliament in May 1980 established VP-Centralen as a self-governing institution to serve the savings banks, mortgage credit institutions and commercial banks that will be its users and will pay for the

cost of the system, Bache said.

System 2000/80 is one of the cornerstones of the system. It will enable investors to obtain their securities in the usual way but, instead of receiving paper bonds, they will be given a receipt certifying the terms of the claim as registered on an account in VP-Centralen's data files. Transfer of securities becomes valid only by registering the transaction in the computer.

The securities center is expected to handle approximately 1.5 million investor accounts and, on a busy day, to record and handle up to 60,000 trade transactions, according to Bache.

Paper Transport Obsolete

This centralized computerized registration of securities will make handling and transport of paper bonds obsolete, Dines Hansen said. Since 95% of them already are on a DP system in savings banks and credit institutions, these users of the VP-Centralen system will only have to extend their existing communications networks within the financial sector to include VP-Centralen's data center, he explained.

In designing the system, VP-Centralen decided to go with standard software to reduce costs and to comply with a decision to choose software before hardware. After a survey of a number of DBMS, System 2000/80 was chosen and then successfully tested by Intel in Europe, Dines Hansen said.

In addition to System 2000/80, the final software environment will include Intel's Plex, Quex and Taps-80; IBM's CICS; the PL/I language and a multiuser, multitext facility.

The mainframes subsequently selected were three IBM 4341 Group 2 systems, each with 8M bytes of memory and running on MVS/SP. Two of these are applications processors and one is a communications processor.

Since there are 16 data centers in the financial sector of Denmark and 20,000 terminals which must interface with the VP-Centralen system, the communications system was intended to be a stand-alone network that could support different types of communications interfaces.

VP-Centralen decided to use IBM's communication management configuration (CMC) concept which separates applications processor and communications processor functions. According to Dines Hansen, communications between the communications processor and the System 2000/80 in the application processor is via Intersystems Communication (ISC) in CICS.

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CW330

From Planning to Implementation 'Honeymoon' in Office Automation Is Over

By Ann Dooley
CW Staff

HOUSTON, Texas — The honeymoon is over in office automation.

That's what an audience at the 1981 Office Automation Conference (OAC) was told here last week by Dr. Michael Zisman, president of Integrated Technologies, Inc. in Philadelphia, who believes that people are finally moving out of the planning stage and into the implementation stage.

Everybody is jumping on the productivity bandwagon, according to Zisman, who commented that everyone wants to improve productivity; but although no one knows what it means, they're working to improve it anyway.

The good news, according to Zisman, is that there are only three remaining human obstacles to office automation systems — vendors, implementors and users.

Vendors are unsure of user requirements and they lack standards, but they are still rushing to standardize, he noted. Vendors are faced with poor human engineering and poor human communication due to oversell and, according to Zisman, are mismanaging growth. Vendors are continually saying, "The system can." But it's a long way from "can" to "does," he warned the audience.

The implementor or office automation manager also faces obstacles, Zisman stated. The implementor is also unsure of user requirements and unsure of his own role — which is an agent of change or even a messiah. He feels responsible for the ultimate solution, but at the same time, Zisman said, doesn't understand the cost/benefit ratio. The implementor lacks planning expertise, doesn't understand the productivity issues and, perhaps most importantly, doesn't understand the anxiety of change. What's more, the implementor frequently thinks in terms of "dumb user," lacks discipline and is caught in political warfare, he stated.

And users also face numerous obstacles, Zisman said. Users themselves are unsure of user requirements, they don't understand that technology needs to be managed, are overwhelmed by technology, dominated by short-term goals or earnings, don't understand the potential and want benefits without paying for the costs, especially in regard to training, he said.

Overall Strategies

Overcoming all these obstacles requires planning and execution, Zisman said. Overall strategies must be developed and the implementation must be process-oriented not product-oriented, he added.

The implementor must become a jack-of-all-trades, some of which should include manager of innovation, technologist, economist, cost accountant, doer, planner, educator and ergonomics specialist. Office automation must be recognized as a process of innovation that is to be managed while at the same time remain consistent with the organization's style and risk profile, the vendor's ability to deliver and the user's ability to assimilate, Zisman said.

Calling for an evolutionary approach to implementing office automation, Richard Fennell, senior research com-

puter scientist at the Federal Judiciary Center, Washington, D.C., outlined some of the possible technical failures that can occur when implementing a system. Managers must be wary of incomplete or inaccurate functional specifications, users inexperienced with automation, designers inexperienced with applications, lack of task standardization, unpredictable catalytic effects and design inflexibility, he said.

The system design and implementation demands total user involvement, Fennell said. Prices and objectives must be defined, incremental testing should occur and ongoing user training and support are critical elements,

he said. Continuous user feedback should be obtained and the evolving needs of the user should be taken into

CW At OAC

consideration, he said.

Philip Pyburn, doctoral candidate at the Harvard University School of Business, told the audience that clerical workers account for only 25% of overall salaries, but that professional and managerial salaries account for 75%. This makes it clear where the real im-

pact can be achieved with office automation, he said.

Many organizations try to implement a program without having a plan or strategy and so become victims of proliferating equipment, little productivity improvement and failed integration, according to Pyburn. Those with a technical plan but no strategy will fail because users quickly outgrow applications and technology, and mounting problems between organization and technology occur, he said.

But the successful organizations are the ones which implement both plan and strategy to allow integration and simultaneous organization and technological growth, he told the audience.

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COMPUTERWORLD

Office of Future Sparks Debates at OAC Meet

HOUSTON — Prospective users crowded into the Houston Convention Center here last week seeking answers to the office of the future in hopes of escaping, as one speaker put it, from the office factories of the past. For every question that was answered, however, two or three more were raised.

The 1981 Office Automation Conference (OAC) — only the second ever sponsored by the

American Federation of Information Processing Societies (Afiaps) — drew 8,000 to 9,000

sions of automation or the whys and wherefores of convincing management to auto-

CW at OAC

visitors, up from the 6,000 who attended last year's conference. The intense interest of the attendees was evident everywhere, at times erupting into debates over the repercus-

mate.

While a few attendees were heard to have tried their luck on the bucking broncos at Houston's now infamous Gilley's disco, the conference

itself displayed surprisingly few Western gimmicks. A strictly business-like atmosphere pervaded the exhibit floor and conference hall.

Whereas the exhibit floor of the National Computer Conference is always jammed with computer acolytes eager to try out the latest equipment, leaving the sessions sometimes nearly deserted, just the opposite happened here. Packing into the numerous sessions

held during the three-day conference, attendees seemed primarily interested in discovering what office automation is all about before turning to specific equipment purchases.

And, in turn, only a few vendors introduced new equipment — perhaps deciding to wait for the larger NCC only six weeks away. IBM, however, made its usual prestigious appearance, for the first time uniting all of its divisions in one exhibit in order to display its integrated DP/WP system.

Other Differences

The conference differed from NCC and other "computer" conferences in other ways as well. Far more women professionals were present than are ever seen at more computer-oriented shows. A large number of the conference sessions dealt with the social impact of automation and the human element and were presided over by academicians and researchers instead of users or vendors.

While people may be confused by the buzzwords or the implications of automating the office, this year's conference made it clear that it is only a matter of time and direction before significant changes will begin to occur.

Trivia Anyone?

If your mind is the kind that hoards delicious bits of information on little-known facts about DP, *Computerworld* wants to hear from you.

CW is putting together a trivia quiz to puzzle attendees at the National Computer Conference. It will appear in these pages at the time of the conference.

Send your trivia questions — and answers — to Linda Rosenthal, Editorial Department, *Computerworld*, Box 880, Framingham, Mass. 01701.

Corrections

"Six More I/O Channels Added to IBM 3033S [CW, March 16], the 3033S was reported to offer a maximum of 16 I/O channels. It is the 3033U that offers a maximum of 16 channels.

Computronics [CW, Feb. 16] is located at 4524 N. Central Ave., Chicago, Ill. 60630.

Dave Kemler is vice-president of marketing for Information Builders, Inc. (IBI), not for IBM [CW, March 23]. IBI markets the Focus data base management system.

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Still Stuck in Mechanized Methods Office Technology in 'Preautomation' Stage

By Ann Dooley
CW Staff

HOUSTON — Office automation is only a fantasy so far because managers are stuck in mechanized rather than automated working methods, according to Amy Wohl, president of Advanced Office Concepts Corp.

Calling the current state of technology a "preautomation" stage, Wohl explained to an audience at the 1981 American Federation of Information Processing Societies (Afips) Office Automation Conference here last week that technical skills are dispersed, rather than integrated, with each function separately mechanized and so far incapable of working together.

Ultimately, text, data, voice and image will be integrated into an information system that can be used as a corporate-wide resource, she noted, adding that such systems are still really only on the drawing board.

Wohl, who received enthusiastic response from the gathering throughout her speech, noted that a strategic office automation plan must be devised which takes into account an organization's growth, personnel and goals. Long-range planning is useful if it is not too long-range, she said. Technology is moving too quickly to plan for what the office will be like in the next decade, so short-run plans must be implemented to achieve the long run, she told the audience.

Task Force

Any organization that wants to implement an office automation plan should first set up an office automation task force that would include multilevel personnel who will decide the scope and specifics of the plan.

The task force should study the organization, the workers at all levels, the work being done and the facilities, in order to grasp the extent of the potential program, she said. Suitable pilot projects should be determined — ones with the right level of visibility and which have a high, fast pay-off. If results cannot be proven quickly, management and everyone else will lose interest and support, she noted.

In implementing an office automation program, top management support is critical. If it is lacking nothing much will happen, she cautioned. The office automation task force must educate management about the importance of office automation while at the same time gaining an understanding for what kind of role top management is willing to play in the overall plan. A fatal error would be to introduce office automation to top management too early in the implementation procedures. Nothing will put an end to automation so quickly as an executive who ends up as a guinea pig for a system that is filled with bugs, she stated.

Once the pilot projects are selected, hardware and software should be chosen either by building onto an existing word processing system, extending DP into the workstation environment or by bringing in a whole new system. And once the pilot projects are up and running — hopefully successfully — they can be used to evaluate and fine tune other projects, she added.

As a word of warning, Wohl advised

management information systems (MIS) managers to take charge of the implementation process. If the MIS manager is not involved, a smart company will simply hire someone called an "information officer" to take charge of the task and the MIS manager will find him or herself reporting — sometimes on an equal footing with the office automation manager — to this new person.

Wohl noted that no matter how exciting the potential for the office automation system appears to be, corporate executives will still frequently need to be sold on the idea.

Wohl suggested that the best selling technique is to rely on the tried and

true method of hitting them in their pocketbooks. Cost justify as much as possible, emphasizing "hard" savings

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At OAC

features, she advised. Prove to managers that salaries will be decreased by the need to hire fewer people over time. Space — both people and paper space — will also be saved, she said.

"Soft" savings can also be emphasized, but this selling technique is usually less effective until the executives

actually see the results for themselves, she noted. These soft savings include increases in the timeliness of work, better work results and better information, all resulting in better decisions, she said.

Another critical step in a project implementation is convincing employees to participate in the system. Some will be willing, others will resist, and occasionally it will be necessary to practice what Wohl termed "benign blackmail" to gain employee commitment to the new system. For those who are resistant to the project, it may be necessary to build a "goodie" into the system, thus seducing people into using it, she remarked.



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Using Free-Lancers May Mean Problems

By Rita Shoor
CW Staff

The number of California-based DP free-lancers may be increasing (see story on Page 17). But clients who seek their services should be aware of potential legal and management problems that may develop if they rely on journeyman contract programmers.

The scenario leading to legal complications usually works like this: A corporation brings a contract programmer in-house to work on a relatively long-term project — from six months to several years. The

free-lancer works the same hours as company employees and is often indistinguishable from one of the staff members.

However, the client company is not withholding taxes or providing workmen's compensation to this "independent contractor," based on either a verbal or written agreement.

At some point during the project, the free-lancer, who is not carrying workmen's compensation coverage for himself, is injured.

He goes before the

Workmen's Compensation Board and claims that his "client" should have provided him with this coverage. If this happens and the agency decides that the free-lancer should, in fact, have been covered, his former client may wind up paying a heavy bill, according to several interviews conducted here.

Criminal Charges Possible

In addition to settling the case in civil courts, it is possible that the firm can wind up facing criminal charges in California, according to one San Francisco attorney.

This can happen if either workmen's compensation or unemployment insurance is not paid in circumstances when it should have been, the lawyer said.

And things go downhill steadily if the Internal Revenue Service (IRS) becomes aware of the situation. "A trigger-happy IRS agent can wreak havoc on a firm" once the agency is called in, the lawyer continued.

This can happen when a free-lancer files a 1099 form, is audited and does not have the money to pay his federal taxes. The IRS can go after the company for not withholding taxes from the payments they made to the consultant — another very expensive proposition.

Pointing out that government agencies do not actively search out these situations, the attorney felt the problem might be more widespread in California than in other states. It probably is not wise to judge the country by what is happening in California because the California Labor Board "is always very pro-employee," according to the lawyer.

However, even if the "IRS has bigger fish to fry," client management can run into internal control problems when it brings in contract programmers, according to Frank Wagner, a senior vice-president with Informatics, Inc. in Los Angeles.

Management Problems

There is an important difference between free-lance DP technicians and other independent professionals such as free-lance writers who might contract to do some work for the same organization, Wagner said. The free-lance writer does not work with a group of other writers, while the programmer is usually part of a team, he noted. "I certainly wouldn't want to manage a disparate group of contract programmers," he said.

He viewed the management problems as more significant than possible legal complications.

Corporate legal departments always "want everyone [in the organization] to keep it clean" and the manager in a company bureaucracy "doesn't need the hassle" of contracting with independent programmers, he said.

'Deplorable' Dilemma

"As an individual professional, I deplore the dilemma" currently faced by DP free-lancers, "but as a businessman [Informatics has a consulting division that often competes directly with free-lance consultants for contracts] I'm trying to burn them to the ground," Wagner said.

Informatics consultants are employed by that company, so federal withholding, unemployment insurance and workmen's compensation are taken care of by the firm. However, there is another alternative for the information systems manager who needs

programming or design work on a temporary basis.

These are the firms often described as brokers by the companies that utilize their services. Jack Strong of the Los Angeles-based Jack Strong and Associates typifies this type of company.

The type of person who fits the "happy-contractor profile" is usually not too concerned about corporate benefits, he said.

Typically, he is a young person who is more apt to be motivated by a high salary than the 35% benefit package offered by some organizations. He also has to be free to move about at short notice, Strong said, citing a recent six-month contract he had set up in Holland simply because the client could not find an in-house employee willing to make the move. "It's a nice way of life" for the right people, he said.



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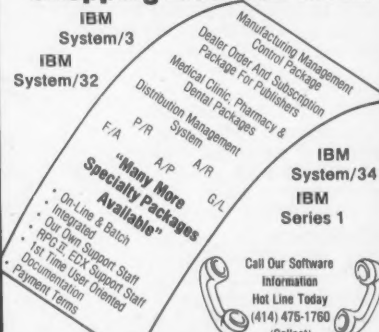
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From Silicon Valley to San Diego California Setting Trend for 'Cottage Industry'

By Rita Shoor
CW Staff

The trend-setting state of California may be the starting place for the "cottage industry of the '80s."

Based on interviews with both corporate and independent information specialists from Silicon Valley, near San Francisco, right down to San Diego, business is flourishing right now for the free-lance technical specialist.

"We need people to fill the void between the end user and the computer," explained Dr. David E. Crockett, computer strategy manager for Palo Alto, Calif.-based Hewlett-Packard Co. He predicted "more companies, more free-lance-generated software and more DP consultants in the future than ever" for the computer industry.

Rather than going through a corporate DP department, "people are looking for complete solutions" to business problems, Crockett said. Enter the programming cottage industry where the technical specialist develops software at home.

Crockett indicated that West Coast firms might be more amenable to this idea than U.S. companies in other locations. "New ideas are welcomed by high-level managers here," he said.

Electronic Switchboard

The corporate DP department of the future may wind up functioning as a sort of electronic switchboard that serves to match up the business problem with its software solution, he speculated. The viability of this department may actually depend on how quickly DP managers adjust to this way of doing business, he said.

Characterizing the West Coast as being at the forefront of the high-technology industry, he maintained that companies would no longer take the position that a problem had to be approached in a rigid, organizationally specified manner. Firms here are more "approachable," according to Crockett.

While software support and royalty problems are still being ironed out for the newly emerging independent "cottage programmer," both large firms and the free-lancers realize that a long negotiation process cuts down on the usable time frame of a good idea. "Everyone is looking for ways of making the relationship straightforward," he said.

As recently as five years ago, Crockett

Seminar Examines Computer Contracts

NEW YORK — A three-day seminar in computer contracts for senior technical staff, users and management will be offered by the Brandon Consulting Group, Inc.

The course was designed to fight what the company says are the costs of inadequate contracts, which, it said, fail to protect consumer interests.

The seminars will be held in Washington, D.C., April 13-16 and in New York from June 8-11 at a cost of \$700, the sponsor said.

Brandon Consulting Group, Inc. is located at 1775 Broadway, New York, N.Y. 10019.

ett himself took the position of "thumbs down" on outside software because of possible control problems. That is no longer true because "the industry has matured," he noted.

Although open to the idea of individually developed software, HP tends not to use contract programmers for in-house work, Crockett observed. Technical writers have occasionally been brought in for an assignment. However, HP takes the position in all job classifications that anyone who works in-house more than four to five months should receive a formal job offer of permanent employment, he said.

That attitude is far from universally true, according to Stephen Wright, a

DP management consultant who operates in the same general geographic area.

Perhaps more typical of the free-lance environment is the case of an anonymous acquaintance of Wright's who has worked with just one client for more than two-and-one-half years. This contract programmer has never had another client during the time he has operated independently.

And it may be exactly this type of operation that can lead to problems for the large corporations with which these contract programmers work, he speculated.

But, potential problems don't seem to be stopping the proliferation of DP

free-lancers, he said. Predicting a "trend toward small business in general" within the national economy, Wright perceived the DP consulting industry as following this tendency towards entrepreneurship.

People are currently more responsive to consulting groups in Canada than in this country, he said.

But, based upon such factors as the increasing membership of the Independent Computer Consultants Association and his own awareness of "at least a few dozen people" who are moonlighting as contract programmers, he felt that the trend was toward more U.S. free-lancers in the next few years.

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Behavioral Techniques Stressed in Course

By Robert Batt

CW Staff

WASHINGTON, D.C. — Influencing Styles Technology (IST), the methodology on which the Harvard Human Resources, Inc. (HHR) course recently given here is based, is behavioral rather than psychological.

"How you prefer to be influenced is behavioral and therefore observable and identifiable," Karen Stewart, HHR vice-president claimed. "Influencing styles are identifiable in a person's behavior and you are constantly giving out clues about how you prefer to influence and be influenced. Unfortunately, most of us are not even aware of 75% of the clues. We are not watching for them, and they go right over our heads."

HHR said that its own research shows that around 50% of people in the DP profession use the procedural style (see related story on Page 19), as their primary communication style, followed by 25% who use the innovative, 20% the supportive and 5% the opportunistic.

But when conditions become unfavorable, the number of people using the supportive style drops to 5% and the number using opportunistic rises to 20%.

Of the whole American business population, however, HHR said the major primary influencing style is opportunistic with a 37% rating, followed by procedural and supportive, each with 26%, and innovative with 10%.

MIS Managers Missing

WASHINGTON, D.C. — A plea for greater management information systems (MIS) involvement in personal communication-type courses came from Bill Hetzel, president of the Education Foundation of the Data Processing Management Association (DPMA), which is sponsoring the Harvard Human Resources, Inc. course on "Influencing Persuasively."

According to the DPMA, finding new solutions for raising productivity and reducing staff turnover is a major challenge facing MIS executives in the 1980s and improved communication is the key. But, Hetzel said during an interview here, while reports from participants of the HHR course have generally been favorable, the rate at which managers are taking up what is on offer leaves a lot to be desired.

"This is the first step into the field of behavioral effectiveness that the Education Foundation has sponsored, and we are a little disappointed that the DP management community is not yet seeing this type of course as something they

need, to the extent we would like," he said.

"On the one hand MIS managers are asking for this type of course, but on the other they are not really getting themselves in on the courses. DP managers have a high awareness of the lack of communication that goes on in our industry, but it is another thing to spend money on tackling it given the competing development demands on them, such as keeping abreast of the technology," he added.

Hetzel claimed that the need was not so much to expand overall training opportunities, as to adjust the balance of courses and give the DP manager 5 to 10 days a year devoted to his own personal development.

"There is much more available in the field of communication than DP managers think, and his main problem is to sift out what is useful to his needs. But when you are up to your neck in alligators, it is more difficult to go in for something which will produce results some way down the road and over a span of years," Hetzel added.

municate with someone who does not adopt that style.

"A key element in data processing is accuracy, structure, logic and disci-

pline. Without these elements the computer would be judge and jury. So by its very nature, DP demands that the computer professional document and be precise and analytical in order for the computer to function," Caracio explained.

"Consequently, data processing people look on communication as a one-way affair, which it is to a large extent, namely man to machine. But in the wider field of business and industry it is two-way, and absolute accuracy is not necessarily what determines the difference between success and failure."

Take, for example, said Caracio, the case manager in a DP department. This type of job calls for working closely with DP technicians as well as top management and support personnel throughout the organization. The manager may find it most effective to use his procedural influencing style when discussing specific system details and implementation plans with his technical staff; his opportunistic style to ensure those deadlines are met; and his innovative style when determining future system needs and integrating those systems into the organizations' long-term plans.

"If he attempts to use the same influencing style in all situations, he may find himself ineffective and frustrated in his job," he added.

During the HHR course, participants are asked to fill out a personal profile consisting of 72 questions, in an at-

(Continued on Page 20)

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To Gain Influence Managers Urged to Talk Less, Listen More

By Robert Batt
CW Staff

WASHINGTON, D.C. — Data processing professionals should talk less and listen more if they want to have greater influence with their users and colleagues, Karen Stewart, a Dallas-based management consultant, advised here recently. The vice-president of development for Harvard Human Resources Co. (HHR) and a former DP manager at Motorola, Inc., believes that one of the keys to greater productivity lies in having DP managers and their subordinates communicate more effectively.

Through a workshop entitled "Influencing Persuasively" that is making its way around the country, Stewart and HHR President Vince Caracio are attempting to make the DP professional more aware of the barriers to communication, thus bringing about more effective interactions and more efficient organizations. "The greatest barrier to effective communication is our natural tendency to evaluate and judge based on our own individual criteria. These perceptions have a two-way role in communication and not everyone is perceiving a situation in the same way as we are," Stewart explained.

According to HHR, DP people suffer from a disease called "analysis paralysis," which greatly inhibits them in their communications with other professionals. A person with this disease is likely to communicate in a coolly rational, logically deduced fashion that all too often leaves the recipient bored and indifferent, if not openly hostile.

"The course aims to get DP people to understand why conflicts arise and help them to appreciate the changing role of DP in the 1980s. The DP manager is in the most optimum situation of any manager in the company. He no longer simply has expert power — now he needs to be much more business-oriented and involved in the whole business," Caracio, a former Xerox Corp. sales manager, explained.

The problem, an HHR spokesman said, is that while the job of the DP professional is to talk to the users and help them to get what they want, all too often he looks at the situation through his own perception rather than the user's.

"Society places enormous value on objectivity, but in the end it all comes back to people, who bring an element of subjectivity to every encounter, and we tend to see events in the light of our own interests and specialties and not even be aware of the bigger picture," Stewart urged.

Four Modes

In attempt to make professionals aware of the bigger picture, HHR introduced in its courses a concept known as Influencing Styles Technology (IST). Based on the work of the Swiss psychologist, the late Dr. Carl Jung, HHR asserted, there are four basic modes of communication. These are:

- The procedural style, used a great deal by DP professionals, particularly programmers, systems analysts and project managers and consisting of a great many facts and data communicated in a systematic, orderly fashion.

- The innovative style, much more unstructured than the procedural mode and concerned more with the overall picture and with long-range conceptualizing as opposed to day-to-day detail.

- The supportive style, which makes far greater use of human interaction. This style is tuned into emotions and feelings; communication is more spontaneous, enthusiastic and overly personal. HHR said that as DP becomes more of a service bureau and consulting function, front-line DP managers will have to use this style more frequently.

- Opportunistic style. This characterizes the action-oriented, do-some-

thing person interested in results. Communication tends to be forceful, direct and decisive. In DP this style is used primarily in the operations area or for self-starting businesspeople.

According to the HHR theory of communication, while everyone uses a blend of all four influencing styles, most people have a primary and a backup style.

"We are most receptive to a style similar or sensitive to our own. We prefer to be influenced in our style rather than in the other guy's," Stewart said.

Stressful Occupation

According to industry surveys, DP is the second most stressful profession

after air traffic controllers, primarily because nothing stays constant and DP people have to precipitate change, which in itself is stress producing.

"The problem is that the DP manager comes into the executive suite with a very procedural approach. For him to become a president or executive vice-president, an essential key will be his ability to use optimally all the communication styles and not just the procedural one," Caracio explained.

According to HHR, any one style may be overused and difficulties can arise when people get locked into one style. "As DP professionals, one of the problems you face is not because of (Continued on Page 20)

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Behavioral Techniques Stressed in Course

(Continued from Page 18) tempt to measure an individual's use of each of the four influencing styles under favorable and adverse conditions. Using a points basis, the scores indicate a person's dominant influencing style, his supporting styles and styles he may overreject.

According to HHR, a person's influencing style is a combination of personality traits, job attitudes and skills, and past person-to-person experiences and is governed by personal beliefs and preferences. "By understanding these basic beliefs, a person can better understand the various influencing styles, which ones are predominantly used and how to determine the most appropriate style for any situation," Caracio said.

"If you understand your

own personal influencing style, that is a plus. If you are also able to pinpoint an associate's preferred influencing style and be receptive to it, you hold the key to more effective communication, personal satisfaction and career advancement," he added.

Caracio said that DP professionals have the greatest difficulty communicating with people who are opportunistic in their style, particularly at middle management levels such as manufacturing executives living on a tight time schedule or salesmen making gut-feel, quick decisions.

"Because data processing people communicate in facts and details, they assume everybody else communicates this way. Opportunistic people, on the other hand, need to get the facts because they like

to get involved, but they do not want long, detailed analyses," he added.

Caracio cited as an example of no communication an IBM account executive visiting a management information systems (MIS) director of a \$30 million company who wanted an upgrade of existing equipment. The IBM man went into the meeting with flip charts and analytical material and proceeded to give a detailed presentation.

After five minutes the MIS executive went to the back of the room, lay on the floor and went to sleep. The IBM repre-

sentative carried on with the presentation.

Selling Environment

The HHR course aims to make participants realize that as users become more sophisticated about DP and its applications to their problems, so it has become essential for DP professionals to communicate ideas effectively, and then influence the user to accept those recommendations.

"Distributed data processing is taking computing out of the ivory tower, black-box world in which DP people put it. We can no longer hide behind our

expert knowledge. The industry has moved from a 'telling environment' to a 'selling environment,' and facts and logic alone will not impress users," Stewart said.

"With the user asking what can the DP person do to me and for me, we need an approach to communication that will allow him to sell himself. Until you get the user to try your ideas on, you are not going to influence him," she added.

HHR claimed the key to this is "active listening." Once the DP person has presented his initial ideas he should stop and ask for a reaction, thus drawing the user out and getting over the conflict of egos. On a scale of 1 to 100, HHR said, American listeners are computed to have a listening capacity of just 25%.

So, the course directors argued, you need to stick to the point, keep your sentences short, avoid saying the obvious and be sensitive to the other person's preferred style.

'Talk Less, Listen More'

(Continued from Page 19) something you are not doing, but because of something you are doing too much," Stewart told a group of DP managers at a Washington, D.C., workshop.

"What counts is the other person's perception of your communication style. Whether a particular style is effective or ineffective is going to change for each person and each situation you deal with," she added.

During the course, participants are given opportunities to discover what their own primary style of communication is and to practice using other styles (see story Page 18).

As Stewart explained: "There is no one style that we are trying to get people to use. However, DP professionals have both overused styles that they use too frequently and overrejected styles which they don't use enough because they feel uncomfortable with them.

"The thing is, if it is important for you to influence some other person you have to show sensitivity to his or her communicating style," she

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Instead of Hardware Personnel Seen New Focus of Disaster Plans

By Rita Shoor
CW Staff

ATLANTA — The current focus on hardware underlying most DP contingency plans will disappear in the next five years, according to V.V. Chellapa, a consultant with Cleveland-based Ernst & Whinney.

Instead of worrying exclusively about hardware backup, the question facing management information systems (MIS) executives of the future will be, "Where do I find the people to handle the system if a disaster should occur?"

The emphasis on the human resource aspect of computer systems is tied to the increasing cost of computer software, particularly when compared with decreasing hardware costs, Chellapa told attendees at a recent Management Science America, Inc. (MSA) conference here.

In the past, hardware expense was approximately nine-tenths of total system cost with computer software accounting for just 10% of the dollars spent, he said. This hardware/software expense ratio has changed significantly to 40% and 60% for hardware and software, respectively. "And, the trend continues," Chellapa observed.

The high cost of software will lead to more installations that are dependent on purchased software packages, he predicted. "So what if off-the-shelf software isn't perfect for your installation?" Chellapa asked members of MSA's Future Users' group. It can be tailored to meet specific needs without requiring "a lot of in-house programmers."

The consultant strongly recommended keeping the current emphasis on software and human resources in mind when setting up a disaster recovery plan for any DP installation.

Several Alternatives

There are several alternatives to be considered when evaluating DP contingency plans, he said.

The first method — and one that is very commonly used — is a mutual support agreement between two or more installations. While this type of agreement "costs nothing but a piece of paper," Chellapa felt that it had several major disadvantages.

Hardware incompatibility was often a problem even though "most of the hardware looked the same on the surface," he noted. Software incompatibility is even more of a problem and it is one that is often ignored until the disaster occurs. Sites with the same hardware can often be running with different operating systems or different versions of the same operating system, Chellapa said.

Another problem resulting from this alternative is that the agreement isn't really enforceable. Therefore, it is difficult to guarantee that the equipment at the backup installation will be available when it's needed, he added.

And the technical specialist finds it extremely difficult to get his own top management to sign an agreement including a penalty clause for nonavailability, even though it is one way of guaranteeing that the backup is there when it is needed, he continued.

A second disaster recovery method involves setting up what Chellapa

called a "shell" of a computing facility. This shell would include all of the communication lines, power lines and air-conditioning that would be necessary if a disaster occurred at the main site, he explained.

In the event of a disaster, the person in charge would have to get a processor to the shell site, but everything else would be there. In addition to the expense tied to this method, the manager has to allow from seven to 15 days before he can reasonably expect to get a customer to the alternate center.

That time estimate is based on an assumption that the machine he needs is readily available, Chellapa cautioned. If not, his only choice may be to go to

the used computer market.

Even if he finds the necessary hardware within 24 hours, however, shipping time will still cost him several days, he said.

Vendor-supplied backup facilities are another possibility that can be explored. In this case, "you are essentially buying [disaster recovery] insurance," Chellapa said. All of the facilities are provided for you and your responsibility is to move the programs, data and people to the alternate site.

Again, this solution is very expensive. It can cost up to \$7,000 per month to have this insurance, according to the planning specialist. There is also the problem tied to the logistics of

doing business on a day-to-day basis from a remote site, he noted.

Finally, these services usually operate on a first-come/first-serve basis, he said. If two or more users "go down the tubes" simultaneously, it's possible that only one client will obtain use of the backup facility. And the wording of the contracts offered through these facilities absolves them of responsibility for "acts of God beyond their control," according to Chellapa.

Although the possibility that two users would require the facility at the same time is remote, the potential customer should be aware that this type of backup service won't pay damages if it can't perform, he said.

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Julliette S. Tehrani



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John L. Kreiger

ROBERT E. LONG has been appointed director of management information services for Magnavox CATV Systems, Inc. of Manlius, N.Y.

Before joining Magnavox, Long held positions in data processing, production and production control at Alcan Aluminum Corp. He also served as manager of data systems of the Packard Electric Division of General Motors.

Long holds a degree in mathematics and physics from Youngstown State College and has done graduate work at Kent State University.

...

JULIETTE S. TEHRANI has been appointed an assistant vice-president and DP manager of Municipal Issuers Service Corp.

Tehrani, who joined Municipal Issuers in 1978 as an accountant-programmer, was with Technology Marketing Corp. as manager of financial services for five years.

Tehrani received a master's degree in business administration from the University of Connecticut Graduate School of Business and a master's degree in psychology from the University of Bridgeport.

...

JEFFERSON G. SUMMERS has been appointed director of management information systems for the New York City Sanitation Department.

Summers' most recent position was vice-president for corporate management information systems (financial division) at Sterling Drug, Inc.

Summers is a graduate of the University of Kansas City and a member of the Association for Systems Management.

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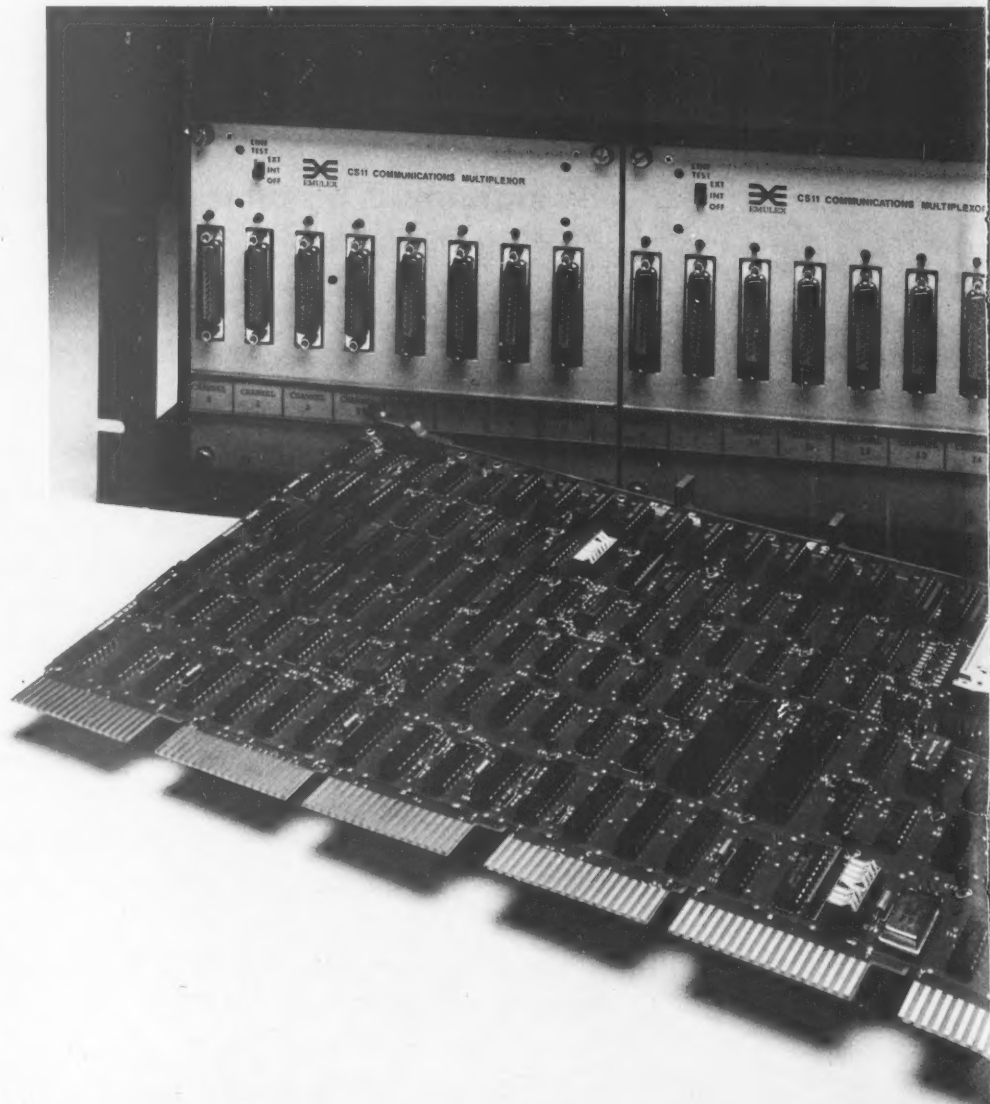
JOHN L. KREIGER has been promoted to manager of computer operations at Bethlehem Steel Corp.

Kreiger is advancing from supervisor of computer operations. He was formerly supervisor of operations analysis and operations analyst for computer operations.

Kreiger received a bachelor of technology degree in electrical engineering from Pennsylvania State University. He is a member of the data processing committee of the Bethlehem Area Vocational-Technical Advisory Council.

(Continued on Page 25)

Improve your communication



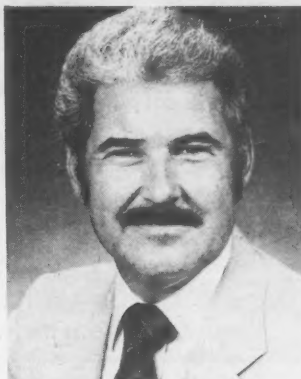
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(Continued from Page 24)

RONALD G. BATES has been promoted to data processing manager at Family Dollar Stores, Inc. of Mathews, North Carolina.

Bates has been employed by the company since 1978. His most recent position in the firm has been programmer analyst. Prior to joining Family Stores, he held several positions in the data processing field.

Bates is a graduate of the University of Nebraska and is a certified data processor.

...

GARY G. STEEVES has been named director of management information services for the Del E. Webb Corp. of Phoenix. Steeves will have the responsibility for the entire corporate data processing operations.

Before joining Webb, Steeves served with Database Systems Corp. and Advanced Systems Consultants, also in Phoenix. Prior to coming to Phoenix, he worked as a vice-president of management services at Quality Farm & Fleet in Muskegon, Mich.

Steeves attended Ohio State University and later enrolled in the International Data Processing Institute of Cincinnati, where he received a degree in data processing.

...

JIM MORTENSEN has been named vice-president, computer manufacturing, for Tandy Electronics Manufacturing, a division of Tandy Corp. of Texas.

Mortensen is now responsible for Tandy advanced products, business products, home computers, software assembly and instruments. Prior to assuming this position, he was group manager for the distribution group of Radio Shack Manufacturing.

A native of Iowa, Mortensen attended the University of Wichita in Kansas, before serving with the U.S. Navy.

...

FRANKLIN L. GREENE has been appointed director of medical information systems for Allegheny General Hospital. In his new position, Greene will work closely with the hospital's data processing service in expanding capabilities and services.

Greene comes to Allegheny from On-Line Systems, Inc., where he was a systems consultant.

Greene holds a master's degree in health affairs and computer systems.

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Speakers and Schedule for Basic Sessions on April 23

The Basic Sessions deal with everything from the need for word processing to cost justification through getting underway, implementing, office communications and management and control for day-to-day operation.



Walshe

Basic Sessions on the first day will be chaired by Willoughby Ann Walshe, executive editor, *Word Processing Information Systems* magazine and *Information & Word Processing Report* newsletter, published by Geyer McAllister, N.Y.C.

Additional speakers include:



Feldelman

Lawrence Feldelman
President
Management Information
Corporation



Sylva

Steven Sylva
Manager, Interactive Service
Division of Management Infor-
mation Services
Commercial Union Insurance

Sylvia Courtney
Office Automation Manager
Commercial Union Insurance

9:00-10:00

First Steps in Word Processing

A discussion of the productivity problems in organizations using standard office equipment and how to improve personnel efficiency with new technology. You will get an emphasis on the latest trends, strategies, and problems in planning automated offices.

10:15-11:15

Surveying Word Processing Equipment

A survey of the latest in basic word processing equipment and software packages and the definitions, capabilities and limitations of each. You will learn how to evaluate and adapt such equipment to your needs.

11:30-12:30

Vendor Session

Special demonstration session with one of four leading vendors of the latest WP/DP equipment. You may ask questions, get solutions to problems and try out equipment.

12:30-1:30

Luncheon

1:45-2:45

Getting Word Processing Underway

You will get help on every aspect of getting word processing systems in place from identifying bottlenecks in your office to evaluating vendors. You'll learn the strengths and weaknesses of word processing equipment, how to get management commitment and how to work with consultants.

3:00-4:00

Vendor Session

4:15-5:15

Cost-Justifying Word Processing

You'll learn the basics of selling management on word processing from determining the benefits and measuring productivity improvements to defining real and hidden costs and predicting future applications. You'll get expert advice on developing a presentation.

5:15-6:30

Informal Networking

Enjoy a glass of wine and mingle with your colleagues, session leaders and vendors.

Speakers and Schedule for Basic Sessions on April 24



Eisen

The second day chair of the Basic Sessions is Jerrold B. Eisen, president of Offices Sciences International, Inc., a subsidiary of Communications Sciences Inc.

Additional speakers include:



Maskovsky

Gerald Maskovsky
Director of The Office of the
Future
Coopers & Lybrand



Lovitt

Herb Lovitt
Chairman of the Board
Communications Sciences, Inc.



Reino

Patricia Reino
Manager, Administrative
Support Services
Olin Corporation

9:00-10:00

Vendor Session

10:15-11:15

Implementing the Plan

You'll begin with a definition of strategic planning and proceed with assessing the human aspects of planning—personnel considerations, staff selection and training programs. You'll learn through the use of case studies demonstrating the relationship of planning to successful implementation.

11:30-12:30

Vendor Session

12:30-1:30

Luncheon

1:45-2:45

Communications in the Office

You'll get the facts on communications transfer from terminal to terminal or terminal to computer aiding inter- and intra-office communications. You'll learn the issues, problems and solutions of mixed vendor equipment; what communications options are available; how to plan a word processing network and how communications is the first step in electronic mail.

3:00-4:00

Management and Control of Word Processing

You'll learn how to handle the crucial challenge of overseeing the day-to-day operations of the system. You'll hear how to establish work flow procedures; how to train and supervise staff; how to set standards and goals; how to measure and evaluate WP personnel and how to perform cost control and budgeting functions.

4:00-5:00

User/Vendor Wrap-Up Session

Potential users, users and vendors will get an opportunity to discuss the current needs, problems, solutions and technologies for today's office as well as in the office of the future.

office automation can hurt you.

Speakers and Schedule for Advanced Sessions on April 23

The Advanced Sessions begin with comprehensive work on office automation concepts through problems and solutions and a double session on achieving full integration. There'll be guidance sessions on applications planning, word processing, interface options and even electronic mail.



Martin

Norman M. Martin, chair of the first day Advanced Sessions, is president of his own consulting firm and has 25 years experience with word/information/data processing equipment and systems as well as digital data communications.

Additional speakers include:



Polizzano

Peter Polizzano
Vice President, Marketing Programs
CompuScan

Eugene Starr
Director of Corporate Development
Ontel Corporation

9:00-10:00

Office Automation Concepts

You'll get a comprehensive discussion on how to assess your company's office automation requirements; how to distinguish between word, information and data processing needs; how to evaluate and set priorities; how to determine the best approach to achieve automation objectives and how to recognize the most common traps—and avoid them!

10:15-11:15

Vendor Session

Special demonstration session with one of four leading vendors of the latest WP/DP equipment. You may ask questions, get solutions to problems and try out new equipment.

11:30-12:30

Problems and Solutions

You'll be given a close look at the problems caused by the inherent incompatibility among various machines and systems, especially when more than one vendor is involved. You'll hear unique methods and approaches to avoid or overcome these difficulties including: Employing digital communications to accomplish a merger of word and data processing applications; maximizing the use of peripheral devices to achieve system integration; detailing the role of facsimile machines, OCR readers, intelligent copiers and similar equipment in automated offices; using "black boxes" and imaginative interfacing techniques to handle phototypesetting and other possible requirements.

12:30-1:30

Luncheon

1:45-2:45

Vendor Session

3:00-4:00

(15-minute break)

4:15-5:15

Achieving Full Integration

In this session you will get details on how to use communications networks to plug gaps that may still remain in the information processing system following the development of a compatible on-site system using the procedures outlined in the previous two sessions.

You will hear discussions on the telecommunications industry describing available and future networks; the relative advantages of value-added, computer-based networks; store-and-forward technology's role in office automation; implementing an in-house communications network and problems with protocol and how to solve them.

You'll get a review of the various types of computerized data bases available to those organizations which have developed the in-house systems capable of accessing these libraries; a discussion of services and a discussion on the importance of planning for the future.

5:15-6:30

Informal Networking

Enjoy a glass of wine and mingle with your colleagues, session leaders and vendors.

Speakers and Schedule for Advanced Sessions on April 24



Greenblatt

Robert Greenblatt, president of National Word Processing, Inc., a firm specializing in the design and implementation of administrative programs to integrate data processing and word processing, will chair the second day Advanced Sessions.

Additional speakers include:

Herb Fried
Systems Officer
Citibank of New York

Joseph Ramellini
Director, Advanced Office Support Systems
CBS, Inc.

Angelo Cappello
Officer Services Manager
Pepsico Inc.

9:00-10:00

Applications Planning for WP/DP

You will be guided over the background information steps necessary to help you to develop a multitude of applications. You'll hear about the important steps in planning/selection; the analysis team; identifying initial applications; determining cost justifications and high payoff applications; expanding the team and applica-

tions. "The software issue, make or buy?" will also be examined.

10:15-11:15

Vendor Session

11:30-12:30

Word Processing Interface Options

You'll get comprehensive information on the word processing interface options available for transferring stored text, data and graphics between locations, as well as a close look at systems and devices such as printers, communications, OCR, COM phototypesetting, ADP, Micrographics and facsimile.

12:30-1:30

Luncheon

1:45-2:45

Vendor Session

3:00-4:00

Electronic Mail via WP/DP

In this session you'll get a discussion on the concepts, technologies, cost justifications, systems and applications of electronic mail with word processing and data processing.

4:00-5:00

User/Vendor Wrap-Up Session

Users and vendors will get an opportunity to discuss the needs, problems, solutions and technologies for today's office and for the office of the future.

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Louise Myerow, Registration Coordinator.

CW

Firm Worked Around Clock to Free Hostages

By Lois Paul

CW Staff

NEW YORK — During the final weeks of the 52 Americans' captivity in Iran, while frustrations mounted and yellow ribbons appeared everywhere, an accounting firm here was working feverishly to prepare the data processing necessary to complete the financial negotiations that led to their release.

Three days before Christmas, Peat, Marwick, Mitchell & Co., an indepen-

dent public accounting firm, was approached by a group of lawyers representing 12 of the largest banks in the country. The frenetic DP task Peat Marwick undertook was to accumulate critical information on how much the government of Iran and its agencies owed the banks in unpaid loans. Their deadline: less than four weeks.

According to Norman Jones, senior computer audit specialist for Peat Marwick, the banks had gathered the necessary data using questionnaires.

"Apparently, when they tried to compile it, they found it was too much of a mass to deal with," he said. Peat Marwick suggested they computerize the data for maximum flexibility.

Margaret Wiener of Shearman & Sterling, one of the law firms involved, explained: "What we wanted to have was a way of printing out in high speed lists of numbers and lists of banks." She said Peat Marwick was required to develop a plan quite a bit prior to the events concerning the settlement.

"We had no way of knowing when things would actually happen," Wiener said, adding, "Obviously there was pressure as a result of the impending change of administration."

"The deadline was as fast as possible," Jones said. "We knew at any time it could become a crisis." He said that Peat Marwick took the information from the banks, on standardized forms, and began compiling it manually Dec. 26.

Special Project

About 20 people were involved throughout the process, maintaining their other jobs and devoting nights and weekends to the special project. The system was designed, and about six people began data entry the week after Christmas, Jones said. "We were told all along by the attorneys that having a computerized report would add a lot of credibility," he added.

"When we started out, we were not sure exactly what the final report needed to be like," Jones said, because negotiations were still ongoing. Different requests were made later in the project, which required adjustments.

Peat Marwick used Datapoint Corp.'s Attached Resource Computer (ARC) system to compile the neces-

sary data. The applications processors had 60K bytes of memory, and the file processors had 120K bytes of memory.

Datapoint 98-9374 top-loaded disk drives with 10/10 disk packs provided 40M bytes of storage capacity. In developing the programs, Jones used Databus language, which has the DSGEN program generator feature.

The negotiations were switched to London in mid-January. Peat Marwick had to move its base of operations and four of the people working on the project there to finish compiling the data.

A computer facility was set up in London through Charlie Small, Datapoint's sales representative to Peat Marwick. Datapool, a Datapoint communications package, was used to set up a telecommunications line between London and Peat Marwick's New York office so that reports could be printed simultaneously in both locations.

The completed software was taken to London on a disk pack, but the Peat Marwick representatives were stopped at customs because of problems with bringing software into the UK. This was quickly remedied as was the more personal dilemma of Jones lacking a passport. "The Treasury Department took care of that," he explained.

From Saturday morning, Jan. 16, when the Peat Marwick team arrived in London, until Sunday evening at six p.m., they worked 36 hours straight, Jones said. This was in addition to working around the clock to meet an intermediate deadline the week before and also on the day before leaving for London.

The fruits of their labor, the final reports, were printed and sent to New York on Sunday morning, London time, Jan. 18. The hostages were released two days later.

Boston Bank Uses Color Graphics To Trace Economic, Money Trends

BOSTON — The Economics Department of the First National Bank of Boston has begun using a color graphics system to illustrate economic and monetary trends in weekly presentations to its senior management and bank clients.

The system is the Z80-driven Model 1999 from Chromatics, Inc. It has a 19-in. high-resolution tube and 512 by 512 dot resolution for a crisp raster scan display that is refreshed with a 60-Hz noninterlaced scan. The monitor offers as many as four windows at a time.

The new graphics system is able to automatically access the computer data base at Data Resources, Inc., an economic research firm based in Lexington, Mass., according to Dr. James M. Howell, senior vice-president and

chief economist at the bank.

"It provides our department with the most current and sophisticated economic figures from which to prepare and update graphic display materials," he said. "We maintain more than 300 individual charts plotting economic activity, and each of them had to be updated manually before we converted to the Chromatics system."

John D. McCarthy, a systems officer in the bank's information systems and services division, said hard copy is being generated with a Dunn Instruments, Inc. camera No. 631, which provides 8- by 10-in. Polaroid Corp. prints and 35mm transparencies. Software developed for First National by Mystic Valley Engineering Co., Inc., of Winchester, Mass., provides a menu of 11 graph formats.

Office Show/Conference Slated

SAN JOSE, Calif. — The 1981 Word Processing and Office/Business Equipment Trade Show and Conference will be held here on Oct. 13-15, and the show's organizers, Cartledge & Associates, Inc., are inviting companies and consultants to submit ideas for Technical Conference Committee consideration.

This year's conference theme is "La-

test Innovations in Office Automation." Abstracts of 100 words on such topics as word/data processing, telecommunications and office/business equipment are required for the conference sessions at the show.

More information is available from Show Management, Cartledge & Associates, Inc., Suite 1014, 491 Macara Ave., Sunnyvale, Calif. 94086.

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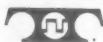
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No Criminal Intent Proven DOT Chief Finds 'Incongruities' in FAA Data

By Marguerite Zientara

CW Staff

WASHINGTON, D.C. — The Federal Aviation Administration (FAA) has not falsified data on air traffic control computer failures, but rather has demonstrated "incongruities and lack of uniformity in the reporting requirements," according to a nine-month study by the Inspector General of the Department of Transportation (DOT).

The study, requested last May by Rep. Bob Whittaker (R-Kan.) [CW, June 16], concluded, "There does not appear to be any criminal intent on the part of anyone concerned," but indicated that outage reports from Air Route Traffic Control Centers (ARTCC) "did not always represent an accurate number for startovers or outages."

The reason for such discrepancies, according to the one-and-one-half-page letter signed by Acting Inspector Joseph J. Genovese, was that "some reports from the ARTCCs included outages in the startover figures and some included startovers in the outage figure."

Furthermore, the Inspector General's

office compared computer outage data submitted to Whittaker by former FAA Chief Langhorne Bond against the Weekly Status Report (Nasnet) submitted to Whittaker by another, anonymous source. The two contained "significant differences," according to Genovese.

"Our findings indicate the primary cause for this difference was that Nasnet reported all scheduled and unscheduled startovers and outages, while Mr. Bond's submission gave only the unscheduled startovers and outages," Genovese wrote.

"In addition, the time loss in the Nasnet was based on actual startover and outage times, whereas Bond's time

loss figure was for outage time only," he continued.

In response to Whittaker's charges that the FAA was guilty of deliberately changing outage codes on ARTCC maintenance logs in an effort to reflect better system reliability than existed, the study conducted an audit of Airways Facilities maintenance logs at four ARTCCs for the seven months ending July 31, 1980.

The audit uncovered two cases where an entry change was made from an unscheduled interruption, "and upon further inquiry by the auditors, these changes were found justified," the report stated.

In comparing the Airways Facilities

maintenance logs to Air Traffic logs, one unreported outage was discovered, and attributed to a case of miscoding, according to the letter. "Accordingly, it appears that computer outages were generally being properly coded," Genovese concluded.

Whittaker, who instigated the study after his own seven-month investigation into FAA reporting techniques, said recently, "While the FAA was coming before Congress and telling us that there had been a standardized reporting system since 1975, in fact, there was none," he added, noting that, since the investigation began, the FAA has made plans to develop a new, standardized reporting system.

Journalists See Mini/Micro Mart Critical in '80s

NEW YORK — Increasing demand for mini- and microcomputer systems from the small business community could be the key factor affecting the industry this decade, a recent survey of business journalists has concluded.

The survey, covering editors from 23 leading trade and business publications including *Computerworld*, also identified the impact of software development as critical to the future of the data processing sector.

In addition, the journalists surveyed thought the dissolution of either IBM or AT&T would bring about a more competitive environment within the industry.

"We have attempted to form a consensus among the nation's foremost computer and technology journalists as to the primary developments affecting the computer industry during 1981 and beyond," said Kenneth D. Makovsky, president of Makovsky & Co., the New York public relations agency that conducted the survey.

According to the company, the survey, which received input from major business journals such as *Fortune*, *Business Week*, *The Wall Street Journal*, *Time* and *Newsweek*, was most responsive to a query on what computer systems will dominate the industry during 1981.

Around 90% of those responding felt that mini and micro systems, with their inherent advantages for low-volume users, would have the greatest impact.

"The major reasons cited for the predicted growth in mini and micro systems is the development of more sophisticated software languages, resulting in improved access to computer processing by small businesses," Makovsky commented.

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Experts report that in just minutes we tend to lose more than 66% of what we hear. Xerox Learning Systems has been working on this critical problem for 15 years. We have helped nearly a million people learn how to be better listeners — and responders. Our new learning system, *Strategies for Effective Listening*, has been shown to produce average gains of 60% in listening ability — with many actually doubling their scores. Just think what a difference it would make if your people heard things right the first time!

3 Help your managers learn how to hire the person who is right for the job.

Finding the right people is key to any organization, and the selection interview is the linchpin of the hiring process. Yet, many managers dread this task. They simply do not possess the skills requisite for a structured, systematic approach to selection interviewing. It is common for them to sell the job rather than determining whether or not the individual is right for the position. Result? All too often the wrong selection.

The loss of time, effects on morale, as well as the human trauma that results from faulty hiring decisions, leech productivity from any organization.

Our learning system, *Focused Selection Interviewing*, teaches managers a systematic approach to effective interviewing without cramping their personal style. Managers learn how to plan an interview, how to conduct it, and how to evaluate the information obtained. And because FSI places such strong emphasis on evaluating candidates according to truly job-related criteria, it naturally fosters compliance

with the spirit and the letter of equal employment opportunity guidelines and statutes.

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Did you know that the typical executive must read 1,000,000 words a week? Or that the average businessperson spends 3 hours of the work day reading communications on immediate business?

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5 Help your managers treat problems as "opportunities in work clothes."

Henry Kaiser defined problems as "opportunities in work clothes." Yet most organizations don't have a formal program to help managers and supervisors develop and hone the discrete skills requisite for problem solving.

Result? All too often a mishandling of even routine problems which can trigger problems in other work units in the kind of chain reaction that can vitiate even the strongest organization.

Our learning system, *Management Discussion Skills II*, provides managers with the skills and disciplines they need to analyze and solve problems systematically and logically. A careful validation study has shown problem solving ability increased some 234% for managers and supervisors who have completed MDS II.

In a recent poll, thousands of top executives identified effective problem solving as what they most valued in their managers and supervisors. MDS II enables you to make sure that your people build real and lasting skills as effective problem solvers. It can give you what you and your organization need most from your managers and supervisors: a systematic approach to solving problems so that they stay solved.

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CW 330

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Most Sophisticated of Its Kind Brooklyn DA's Office 'Doesn't Fool Around'

By Bob Johnson

CW New York Bureau

NEW YORK — "This DA doesn't fool around. When we need something, he makes sure we get it. That's one of the most important parts of establishing a good working system — the ability to obtain the resources."

That is how Raymond L. Michael, special assistant to Brooklyn District

Attorney Eugene Gold and chief of planning and systems, describes his boss' attitude toward computerizing the Kings County office.

As far as DP is concerned, the Brooklyn office, which is the third largest district attorney's office in the U.S., is the most sophisticated of its kind, according to officials here.

Hooked up via dedicated telephone

lines on a time-sharing basis through the Victim's Services Administration (a nonprofit agency working in conjunction with the city) to Medi-Tech Corp.'s Data General C300/CPU in Cambridge, Mass., the Brooklyn district attorney's office has implemented a variety of computer services. Among them are a computerized case tracking and indictment printing and filing system for the Grand Jury Bureau called the Facility for Automated Case Tracking (Fact). In addition, the office is currently working on an intensive investigations system which will be fully operational at the end of April.

The unique aspect of such a system, officials said, is that it includes the capability of an "anything but everything" sort. For example, 250 characters of information can be sorted into any field, such as license plates and addresses. If, for example, a car visits a particular address frequently, a match will appear in the system.

Michaels hoped that the new investigation system will utilize the city's Computer Service Center, the major service bureau that now handles a good portion of the DP work for New York City.

The ability to know where any case is at any given time within the Brooklyn criminal justice system is what the district attorney's systems people are most proud of when describing Fact. What used to be accomplished with three by five file cards and four clerks is now down with only one operator at a CRT terminal.

Monthly Newsletter Covers DP Training

BETHESDA, Md. — A monthly newsletter devoted to DP training is being published by Gary Slaughter Corp. (GSC).

Entitled "DP Training Monthly," it will provide news, advice and practical recommendations about DP training. DP training directors will be used as sources, as will the publisher's staff of contributing editors, a spokesman said.

The cost of the newsletter is \$100 yearly and \$70 for each additional year. The company is also offering a free copy of the *Data Processing Training Handbook* as an incentive for subscribers, GSC said from 4810 Montgomery Lane, Bethesda, Md. 20014.

DP Personnel Guide Treats Interviewing

HUNTINGTON, N.Y. — *Interviewing and Selecting Financial and Data Processing Personnel* is a guide, published by Personnel Publications, aimed at helping employers select their staff.

The four-part guide presents lists of job-related questions, prototype interviews, a glossary of computer-related terms and a section on legal and illegal questions in the interview situation.

The publication is written by Arthur R. Pell, professor of personnel management at New York University and costs \$4.95 from Personnel Publications, P.O. Box 301, Huntington, N.Y. 11743. A bulk price schedule is available upon request.

The indictment printing function calls on the entire New York State Penal Code, which is stored in Cambridge. It handles 20 indictments a day, seven days a week on the average and is virtually error free, claimed Robert N. Kaye, chief of the Brooklyn Grand Jury bureau.

After the name of a defendant is entered, the system automatically inserts it where necessary in other parts of the indictment, a task which previously took a great deal of time. Other information, such as the date of the crime, will also be repeated where necessary, further reducing the likelihood of an error.

Michael noted that a benefit of the system is that every district attorney's office in New York State can be on-line to Fact by telephone if it has the right hardware at its end. Because all of the state's penal code is applicable, the system simply has to recognize the names of other district attorneys and indictments could be printed for all of the counties in the state. Presently, only two other boroughs, the Bronx and Queens, have expressed interest in the system.

The criminal court function is only one leg of the system which includes the ability to expedite complaints in the district attorney's complaint room more efficiently.

In order to become more familiar and friendly with terminals, Michael programmed games into the system for the people entering complaints in the district attorney's office complaint room.

Fact is also scheduled to be functional for Supreme Court cases in New York within six months.

District attorney officials note that what is most amazing about the complete setup is that it was accomplished on a virtual shoe-string budget. Michael said that the indictment printing function initially cost about \$2,000 to install. A mixture of different CRT terminals is used and already-used desks were modified by carpenters to accommodate new hardware.

Bureau Chief Kaye said, "To my knowledge, no other [district attorney's] office in the country is as technologically functional as this one."

Design Engineering Topic of Conference

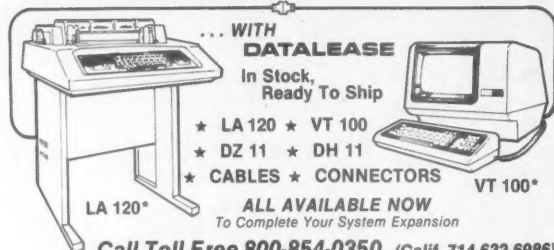
CHICAGO — The 1981 National Design Engineering Conference is slated to take place here April 27-30, according to show coordinators at Clapp & Poliak, Inc.

"Computers Throughout the Design Function" is this year's theme, with over 50% of the conference sessions computer-related.

The seminar schedule includes sessions on microprocessors and computers, design and manufacturing of plastic parts, optimal design methods in engineering, advanced engineering design with plastics, a finite element workshop, computer graphics and applying Japanese techniques to U.S. industry.

Complete conference programs with further details are available from Clapp & Poliak at 245 Park Ave., New York, N.Y. 10167.

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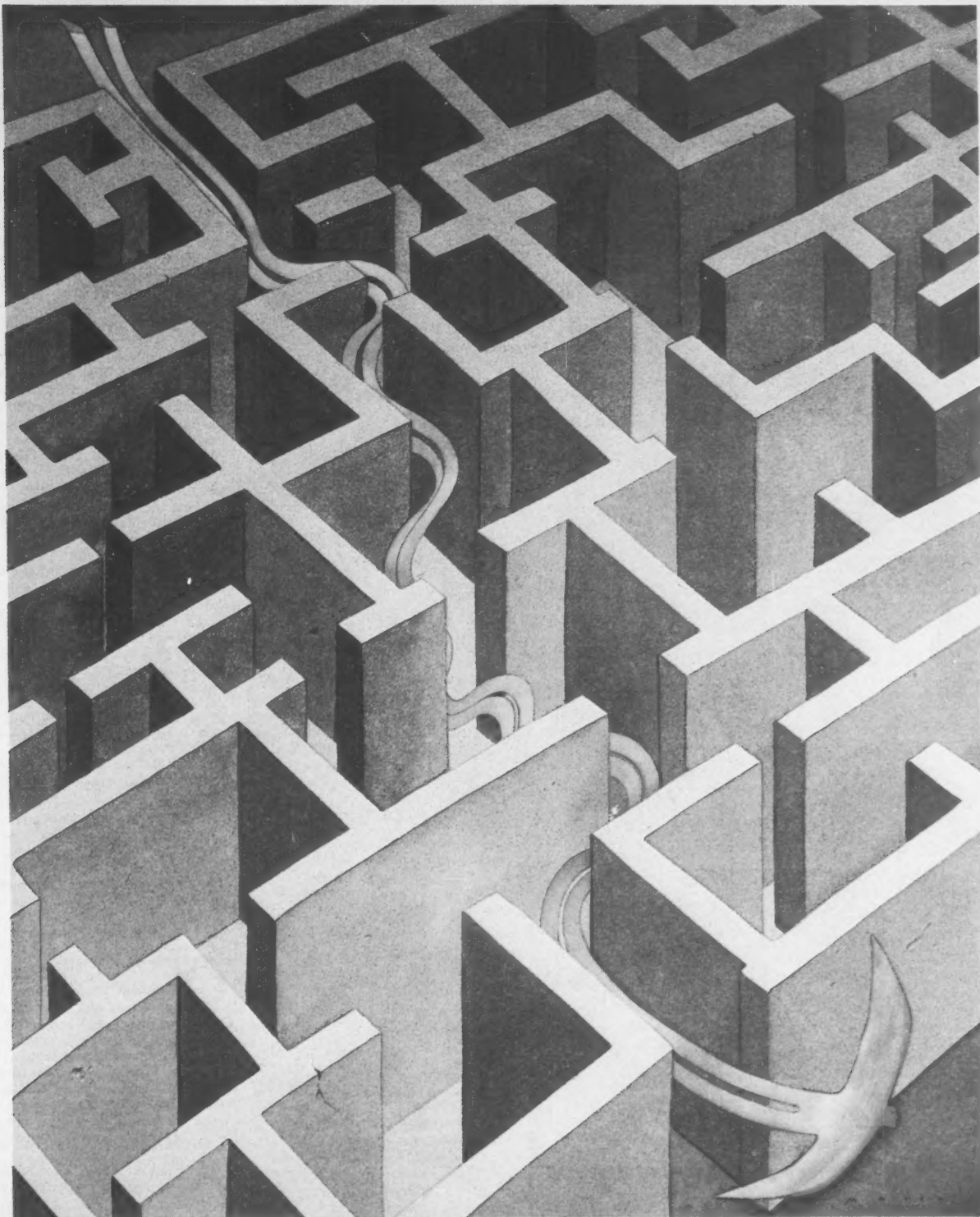
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When Is It Best for an Organization to Seek

Q In past columns you've discussed how to find consultants. I would also be interested in your thoughts on when to use them.

A The DP/MIS consultant should not be confused with contract programmers and systems analysts. The use of contract programmers, analysts and other MIS professionals for work force augmentation is an entirely different question.

The MIS consultant is most effectively utilized in providing specialized expertise (strategic MIS planning, networking and so on), rendering new insights and different perspectives, confirming or refuting a decision and aiding in a specific decision-making

process.

I would be remiss not to take this opportunity to comment on the use of consultants. They are underutilized by some and overutilized by others. The company struggling to maintain the status quo will invariably benefit greatly from the recommendations of a competent consultant. Unfortunately, many companies have a written or implied policy that precludes retaining consultants. In this volatile industry, no computer center can hope, nor would they want, to maintain up-to-date expertise in all facets of information services. Such policies can be stifling to corporate productivity.

At the other end of the spectrum, some companies call in consultants to assist in routine decisions and in cer-

tain less desirable activities. These companies are developing an unhealthy dependence on consultants and are forfeiting the opportunity to gain valuable internal expertise.

Q As a person who has been very actively involved in ANSI standards development, I read with interest your answer to the person requesting information of Fortran standards.

I agree with you wholeheartedly that "standards are a serious problem facing the future of computers and information processing and are the responsibility of all those involved." It is imperative that more people become in-

involved in the standards process, both in developing standards and using standards. Standards work is not glamorous, it is long and tedious, but it is vitally necessary if the industry is going to grow and prosper.

You mentioned that the "X3 membership roster listed only 19 manufacturers of computing hardware and 14 special interest groups." Computer Business Equipment Manufacturers Association (Cbema) is certainly doing everything it can to keep it that way.

Administering a standards program is very expensive. Cbema, as secretariat of ANSI X3 and X4, spends hundreds of thousands of dollars every year to support these two committees. All secretariats face the same burden; this is the price an industry must bear to have a healthy standards program. Cbema is the only ANSI secretariat that recovers its costs by charging committee members for membership. X3 membership dues are \$2,500 per year. Is it any wonder there are not more members?

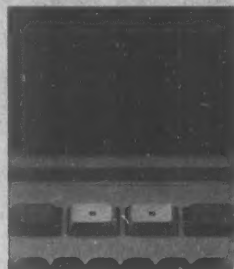
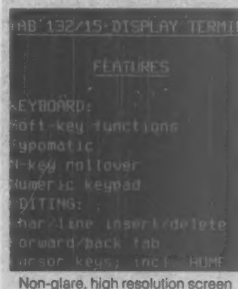
Other secretariats finance the cost of administering the program by publishing and selling the standards they write, or they simply underwrite the expense as the cost of a growing and healthy industry. Cbema has set a precedent and a very unhealthy one. When membership on a standards committee costs money for dues, only the big manufacturers and the special interest groups can participate. This could lead to fraud, corruption and, certainly, government intervention. Cbema has taken the first step to destroying the most successful example of the free enterprise system in existence in this country. There has to be a better way. The computer industry can underwrite its expenses. Other industries, much smaller than the computer industry, are doing it.

Let's preserve the voluntary standards program in this country and encourage free and voluntary participation in the standards process. We have one of the finest standards programs anywhere, and one we can all be proud of. It has worked too long, and too well, to be jeopardized for a few dollars.

A Only now, with the trend to decentralization via integrated networks of computers, are consumers and industry alike beginning to recognize how critical the not-so-glamorous standards are to continued progress. Successful implementation depends on involvement. Your letter challenges the computer industry and Cbema to seek ways to encourage involvement.

Q I attend at least one, and sometimes two, major DP conferences a year. I can't help but think that some of these marvelous successes described in presentations are too good to be true. Overall, I feel these conferences are a valuable experience, but I usually leave wondering how we can be so far behind these other companies. Can I believe everything I hear?

A Some are indeed marvelous success stories, but we all have a tendency to sugarcoat our deeds. I once heard a presentation on a revolutionary new system that sent me clawing for more information. The implica-

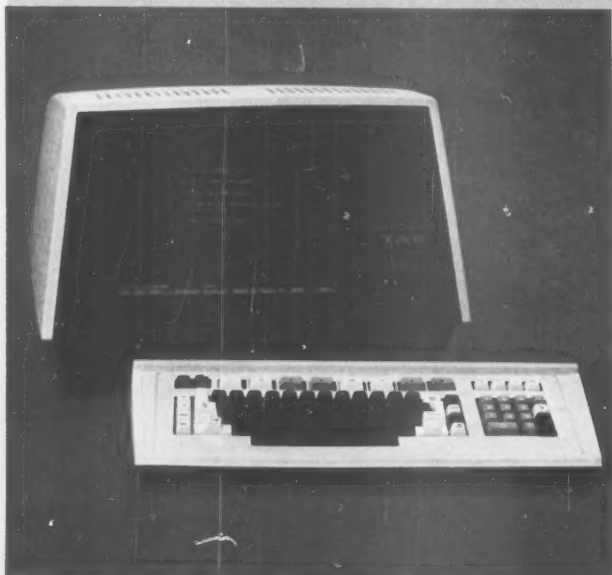


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Advice of MIS Consultants?

tion in the presentation was that the system was implemented and operational. In reality, it was declared infeasible and the project was dropped a year earlier. This scenario is not as uncommon as one might think.

One DP manager made regular presentations throughout the country during the three-year development process of a state-of-the-art system. Within his company and within his industry, he became somewhat of a hero. Everyone was led to believe that the system was not only becoming a reality, but on schedule. He, of course, bailed out before the project was declared a disaster and was scrapped.

Many of these "success stories" are too good to be true.

be a hardware or software specialist. The MBA provides the education needed when you advance to management and must bridge the gap between DP and business.

A As I've stated in previous responses, the graduate degree that one should seek depends on the individual's background, maturity, circumstances, career aspirations and, of course, availability of degree programs.

The MBA is a viable option, but not appropriate for all management aspirants.

I must take exception to your statement regarding the education provided by an MBA. MBA programs, like so many corporations, have been slow to

recognize the importance of management of corporate resources. The typical MBA program offers an introduction to programming and business systems. These subject areas should be

handled like introductory accounting and made prerequisites for admittance, not part of the curriculum. The MBA student should be exposed to strategic planning for information services, not Fortran.

MBA programs have been derelict in course offerings in the area of information resource management. Awarding MBA's without higher level study in this area is akin to selling automobiles without steering wheels.

In all fairness, a handful of MBA programs have sophisticated offerings

Turnaround Time By Larry E. Long

in this area. To no one's surprise, they are the so called "good" MBA programs.

Long is a professor at Lehigh University, a DP consultant and author.

Have a question? Send it to Larry Long, Editorial Department, Computerworld, Box 880, Framingham, Mass. 01701.

Q I just read your answer to the person who wanted a No. 1 or No. 2 position in a DP organization. I, too, have more than 14 years of DP experience, the last seven years as an operations supervisor. I am 33 years old and have many years of my profession ahead of me. Your recommendation was to possibly use director of programming or systems as a stepping stone.

Why is systems and programming always the key to DP directorship? I do systems work and have done extensive programming over my career. I even teach DP at the local community college. Are you suggesting that I cross over to systems and programming in order to reach my goal of DP director?

A Systems and programming is not always the key to securing the No. 1 information services position. Operations managers have also had success in being promoted to the No. 1 slot. However, since systems and/or programming managers are exposed to more facets of DP and are closer to the needs of the organization, most internal promotions come from these positions.

Hard realities dictate that an operations manager seeking a one-jump promotion to DP director may have to look outside of the company or, internally, in a smaller satellite facility.

Q I can sympathize with the person who had a boss who doesn't make work assignments or even inquire about work being done by persons under his control. We have one in our shop, too. Doesn't everybody? In answer to your question about what he does, I can only relate what our boss does. He reads *Computerworld* a lot.

A I recognize it's no solace, but my mail indicates that someone must be cloning nonmanaging DP managers!

Q After reading your reply to the question "Is a graduate degree of any value? Which degree is best?" I couldn't help but put in my two cents.

The answer is definitely a Master's of Business Administration. In my capacity as a counselor and advisor to young people who work for me, my advice is to get an MBA, unless you are going to

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Don Cutler, Chief Systems Engineer,
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and heart pacers, with the microcircuit activated to simulate operation. Pascal-1 handles these processes with speed and precision.

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Writing correct code is easy because of the logical structure and clarity of

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Left: Pascal-1 controls ESI's laser trimming system. The laser repairs semiconductor memory chips, replacing faulty cells with alternates.

Below: ESI dominates the industry in the computer-controlled laser adjustment of microcircuits. Pascal-1 programming flexibility gives ESI access to many different markets.

Software Makers Get Lesson in How to Sell It

By Bob Johnson

CW New York Bureau

NEW YORK — DPers interested in getting into the proprietary software business got a lesson in how to do it from Al Roberts of the University of Wisconsin's Academic Computing Center. Roberts discussed the problems and potential of selling software at the spring conference of USE, Inc., a Sperry Univac users group, held here recently.

Calling on his personal experiences with selling com-



mercial software designed at the university, Roberts noted that the high cost of producing in-house software, coupled with the current shortage

of programmers, has made the time ripe for the independent or institution ready to sell.

"If a program has potential usage at many installations, is relatively easy to install, parameterized, easy to use and well-documented, then the organization that develops, maintains and supports it can distribute it at a lower product cost per installation than the product cost an installation incurs developing it by itself,"

he stated.

Citing the pronounced effect of the 1969 unbundling of IBM software, Roberts added that it is now OK to buy "not-invented-here" software. In 1980, in-house software increased only 12% in dollar value as opposed to software bought outside, which increased 44%. "The independent software industry is expected to be a \$1 billion-a-year industry," he said.

Successful software selling requires organization of resources and a distribution plan, Roberts said. The organization plan should contain four essential ingredients, he said. They are: licenses and agreements, marketing and promotion, response to requests and software distribution.

In licensing, some form of legal agreement is needed to maintain proprietary rights and protect against legal claims. The agreement should cover such things as limiting the use of software to a single CPU, defining supplier obligations concerning maintenance and support, copying and modification permission, improvements reverting back to the supplier and trial use, payment and cancelling conditions.

One area of the agreement Roberts said that was sometimes a problem was the disallowed claims or "hold harmless" clause against the supplier. This simply states that any loss or damage resulting from use of the software is not the supplier's responsibility. He suggested that this be eliminated if possible because of the time and problems that it creates.

When it comes to marketing and promotion, experience, intuition and market research are the key elements, with an emphasis on making the software known to as many potential customers as possible. "Advertisements, promotion and all other marketing techniques must be used," stated Roberts.

Buyer's Information

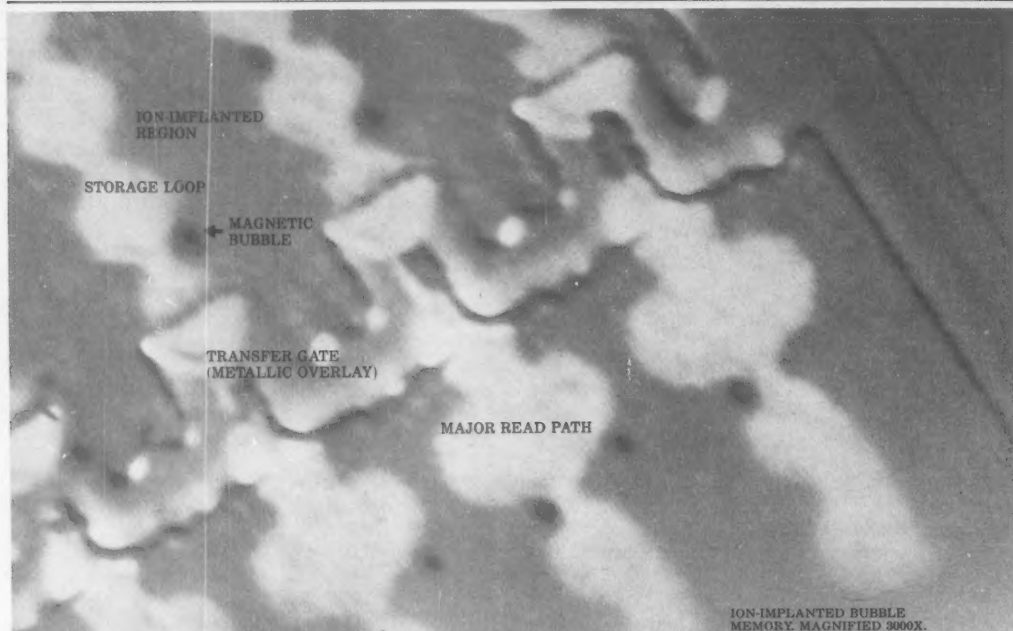
The information sent to the prospective buyer is important and must contain brief descriptions of each available program and separate product descriptions for the installation manager and the end users as well as technical data.

The technical data should include hardware and operating system requirements for the installation of the package, including computer model, version of the operating system and minimum memory and peripheral requirements, according to Roberts. "Enough information should be supplied so that anyone contemplating installation will be able to make a judgment as to whether the package can be installed reasonably and run correctly," he added.

Describing the major performance features of the package was also something that should be done, giving examples of what the package actually does.

Requests should be answered promptly and in detail. One person should be in

(Continued on Page 35)



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Value Tied to Accessibility

Treat Data as Manageable Resource, Firms Told

By Bob Johnson

CW New York Bureau

NEW YORK — A company's information is a resource and should be managed as one, according to consultants Kerry Hartley and James Murray of Data Base Management Associates, Inc.

Addressing the topic of "What Every Chief Executive Office Should Know About Data Base Management" at the recent spring conference of USE, Inc., a Univac users group, the consultants said that the value of data relies on whether it is readily available. The manager who perceives this will make the greatest contribution to his company, while better understanding the nature of data base administration.

Murray said that during the last decade, the new position of data base administrator (DBA) was created simply to supervise the data base group. With the advent of such data base management systems as the Sperry Univac DMS 1100, the DBA now must organize, define, access and monitor the performance of data. The DBA has, in effect, become a "super systems analyst."

Murray added that the DBA is now considered the custodian of corporate data, a resource as important as cash. Like his counterpart in the financial department, the DBA must combine analytical, technical and administrative skills in an effort to successfully

expedite the flow of data.

Another key responsibility of the DBA is proper planning for a data base

management system, the speakers said. It is the DBA's job to select the data base software and to plan the data base environment. "The DBA is not merely a technician, but an administrator and planner as well," they said.

Securing the integrity of a corporation's data base is another im-

portant aspect of the DBA's responsibility. Ensuring that no data is lost and that on-line availability is present are key factors, the consultants said. In the consultants' view, the future of data base management may well be reflected in the creation of a new corporate manager called the Information Resource Manager (IRM). The IRM would be one of a three-part structure within a corporation: One part would handle traditional business functions; the data management organization would offer data base support to the corporate organization; and the physical and logical data organization would supply data bases for each corporate function.

Software Firms Given Lesson In Sales

(Continued from Page 34)

charge of collecting requests, assembling information and interfacing with the licensee.

Roberts used a "contact slip" in his operation which included information on the inquirer's area of software interest, the user's computer systems and so on.

Information Packets

After the information has been collected and if possible stored on a data base, information packets are then sent out containing the program library catalog, a price list, an order form and two copies of the agreement form.

Once the customer returns the appropriate order forms, the distribution process begins, which, according to Roberts, is the payoff. When an order is received along with signed agreements and a purchase order or payment, a master program tape, associated documentation, a copy of the agreement and new order forms and agreements should then be shipped to the customer.

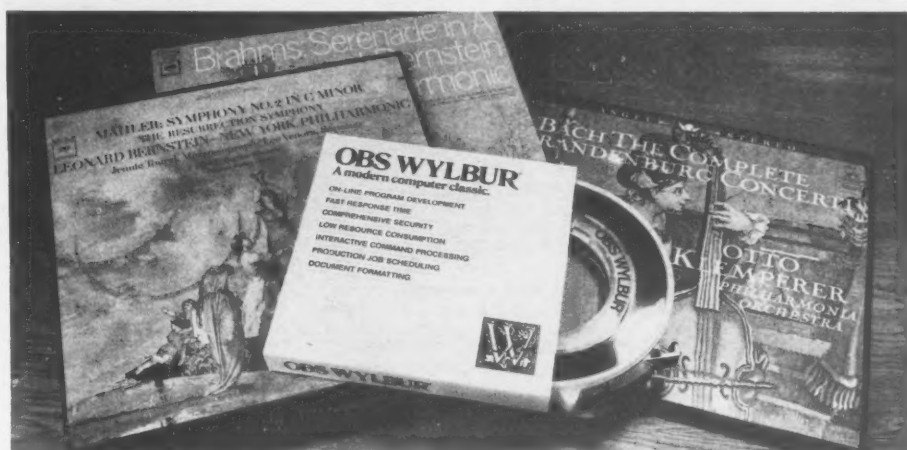
Billing and record keeping are also important aspects of the distribution process, Roberts said. This, too, may reside in a data base.

Tapes Provide MIS Guidelines

NEW YORK — John Diebold and James L. Hayes, president of the American Management Associations (AMA), examine the expansion of management information systems (MIS) in conversations made available on three audio cassette tapes by Amacom, a division of AMA.

The tapes cover guidelines for investment in MIS systems, corporate use of small computers, the role of telecommunications, the office of the future and the emerging role of the MIS professional.

The series, called "Computers and Communications: Their Management and Integration," comes with a brochure and binder and costs \$55 from Amacom, 135 W. 50 St., New York, N.Y. 10020.



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S&L System Processes Loan Services On-Line

By Lois Paul

CW Staff

SAN FRANCISCO — A data processing and communications system designed to provide on-line processing of loans and a host of new consumer services has begun full operation at Citizens Bank and Trust here.

The system, Sperry Univac's CFS-1100, will reportedly eliminate much of the costly and time-consuming paperwork associated with savings and loan (S&L) operations. One of the biggest changes is the on-line processing of loans, with each loan office connected by terminals to the central computer.

CFS-1100 was jointly developed by Citizens Bank here, California Federal Savings and Loan Association in Los Angeles and Univac. Citizens Bank, with nearly \$3 billion in assets, is the 14th largest S&L in the country; California Federal is ranked fourth.

Development began about four years ago, with California Federal serving as the test market for the system. A more powerful version of CFS-1100 began operation at Citizens Bank last month.

The software for CFS-1100 is based on Cobol and DMS, Univac's data base management system. It runs only on Univac 1100-type equipment. Univac currently produces all of the equipment used with the system except for teller terminals.

Citizens switched systems two years ago from an IBM 360/40 and 360/65 to Univac's Series 1100/81 Uniprocessor, according to Jim Wilson, director of technical services at Citizens. At that time, California Federal had just implemented the CFS-1100 system.

Several Bids

Wilson said that Citizens put out bids several years ago to Honeywell, Inc., Burroughs Corp., IBM and Univac. By process of elimination, the choices rested with either Honeywell's Funds system or Univac's CFS-1100.

"Actually, we did select Honeywell, assuming it passed the benchmark," Wilson said. He explained that because people who were at Citizens at the time were "really sold" on Honeywell's Series-60 Level 68 Multics system, Honeywell was forced to bid on this equipment.

"It would not effectively run an S&L

School Offers Degree In Computer Science

HERKIMER, N.Y. — Herkimer County Community College is offering a new two-year degree program in computer science designed for students who wish to transfer into computer science to complete their degree course.

The program concentrates on machine-language programming, computing, scientific programming, physics and other related topics. Successful candidates will be awarded an Associate in Science Degree. Part of the course will deal with practical experience with various computer systems, according to a college spokesman.

More information is available from the Director of Admissions, Herkimer County Community College, Reservoir Road, Herkimer, N.Y. 13350.

package which was the predecessor to Funds," Wilson said. "At the benchmark, at Honeywell's center in Phoenix, it did not work out and, at that point, Citizens elected to disqualify Honeywell and to reopen negotiations with Univac," he explained.

Univac rediscussed its package with Citizens and completed a similar benchmark at its center in Minneapolis. "What was actually run there was a simulation of the package that was being used at California Federal," Wilson explained. "It effectively did what Univac said it was going to do." Citizens' decision then came down to qualifications on the benchmark, and Univac received the contract.

Wilson said, "Honeywell probably should have bid Series 60 Level 66/DPS 1 or DPS2, the heart of their equipment which actually runs Funds." However, he said he personally would not have selected Honeywell over Univac.

"I don't really think Honeywell could have done the job," he said, noting the company had come in with a very low bid. "It would have been the case where I would have been facing as many amendments as I am now and maybe more," Wilson said, adding, "That pretty much has been the case in their other installations where they actually did install Funds."

Year-Long Conversion

According to Wilson, the conversion to CFS-1100 took a little over a year to adapt the system and complete necessary training. The Advanced Loan System (ALS) became operational on Feb. 9, he added, marking the system's move into full production.

Citizens had used IBM equipment for about a decade, Wilson said. The Univac 1100/81 Uniprocessor the company currently is using has 32K bytes of high-speed memory and 1M words of buffer storage.

The bank uses eight Univac 8433 and two 8450 disk drives to provide 1.5G bytes of on-line disk storage. General Automation, Inc. equipment handles the control unit in the branch and the front-end processor connected to the host on-site. TRW, Inc. teller terminals and Univac UT-S-400 CRT terminals are used.

Citizens hopes eventually to connect most of its 86 branches to the new computer system and possibly eventually to offer additional services, according to a recent article in the San Francisco Examiner & Chronicle. The article speculated that a survival tactic for S&Ls in this time of high interest rates and new competition is to offer one-stop shopping services. A computerized system is the means to make this work.

California Federal reportedly committed \$25 million in a five-year project in 1975 to its new system. Wilson said it was a big change for the company. In an interview with the San Francisco Examiner & Chronicle, James Anderson, senior vice-president of California Federal, said, "Ten years ago the average loan service agent was handling 2,000 loans a year. Right now, each of our people is doing 8,000 per year and soon we'll have that up to 10,000."

Rival Invention of Writing

Sagan Sees Computers 'Remaking the World'

By Jeffrey Beeler

CW West Coast Bureau

SAN DIEGO — Computers rival the invention of writing as one of the most profound innovations in human history and are "remaking the world at a phenomenal rate," according to noted astronomer and author Dr. Carl Sagan.

"We're in the throes of another mighty technological revolution, and the people who are alive today are the first ones to be a part of that revolution," Sagan said during a recent graduation address at Coleman College, a small local school specializing in undergraduate computing instruction.

Sagan, a Cornell University astronomy professor who is probably best known to the general public for his Pulitzer Prize-winning book *The Dragons of Eden* and for his recent Cos-

mos television series, credited computers with providing "a whole new way of looking at the world."

Public Anxiety

But at the same time, he warned, computers have also become the object of widespread public "anxiety," especially among the older generation, which has generally had much less exposure to high technology than many of today's schoolchildren.

"A lot of people are very concerned that this enormously powerful new technology is soon going to take over the world and run their lives," Sagan told a 96-member Coleman College graduating class that included his son Jeremy.

To relieve the public's deep-seated misgivings about computers and assure the world that high technology is

"fundamentally nice, systems personnel have an obligation to do much more than just put their equipment to work," Sagan said.

They must also explain to an uneasy world how their hardware operates, he added.

Systems personnel wield an "enormous amount of power" over the non-technical majority of the population and thus have a responsibility to make sure that "computing technology is always applied humanely," the astronomer said.

Astonishing Pace

In other remarks, Sagan characterized the computer industry's recent pace of technological innovation as "simply phenomenal" and "astonishing," and he predicted at least another 10 years of continued rapid developments.

In 1960, he recalled, the typical processor boasted about 100 active components per cubic centimeter. Today, that density totals 10 million components per cubic centimeter, and by 1990, the figure is expected to grow another thousandfold.

But while component density is doubling approximately every 14 months, the cost of that circuitry is being halved every two years. A logic chip that cost one cent per gate in 1980 will cost 0.1 cent per gate 10 years from now, Sagan predicted.

A similar trend toward improved per-

formance and decreased cost is currently being observed on the random-access memory front. Twenty years ago, a typical processor could store the equivalent of a 15-page pamphlet in one cubic meter, for a cost of about 10 cents per bit.

Today, the same amount of space can hold the contents of 2,000 books for a cost of 0.01 cent per bit, and by 1990 a cubic meter or processor space will be able to contain all the information in the Library of Congress for about 0.001 cent per bit, Sagan said.

Obsolescence Threat

This "absolutely stunning" pace of past and expected technological development means that systems personnel face the threat of professional obsolescence unless they constantly renew their knowledge of their chosen field, the astronomer said.

"Your education isn't finished," he advised the graduates, "because a week from Tuesday another new and important development is likely to appear on the scene and dramatically change the face of the industry."

Sagan urged his audience "to continue to work very hard to keep abreast of your field's latest technological advances." Otherwise, he warned his audience, "the people who will be graduating from this institution five years from now will be doing the jobs you hope to get today."

DPMA Foundation Elects Officers

PARK RIDGE, Ill. — Dr. William Hetzel, director of the Information Management Institute in Jacksonville, Fla., has been elected president of the Data Processing Management Association (DPMA) Education Foundation.

Hetzel was elected to the Foundation's board of regents in early 1980 and subsequently served as vice-president.


He joined the institute early this year, after serving as senior vice-president of administration for Florida Blue

Cross/Blue Shield in Jacksonville.

Dr. Georgia B. Miller of the Indiana University School of Business, Administrative Systems Department, was elected vice-president of the Foundation, succeeding Hetzel.

Miller was elected a regent in 1979.

Newly elected to the board of regents was Terrence J. Boyer, vice-president and manager of information systems planning and control of the Mercantile Trust Co. in St. Louis, Mo., the DPMA announced.



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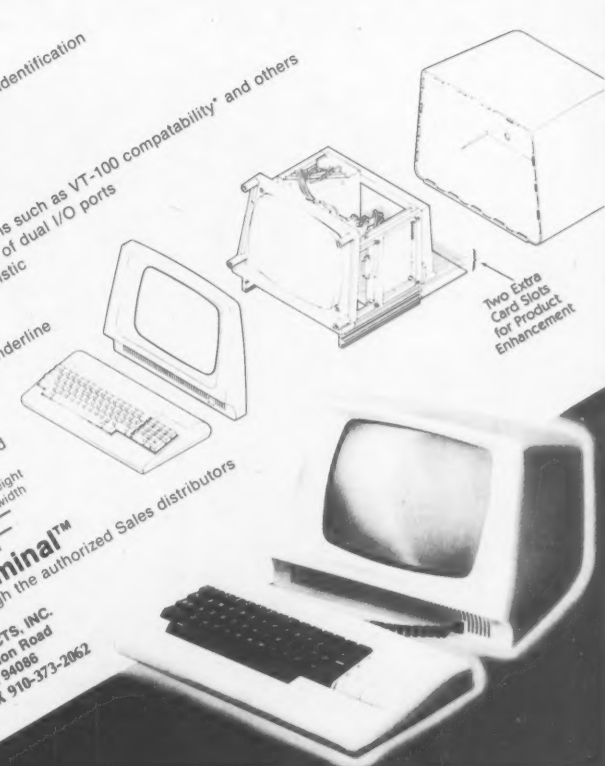
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Spaniol Elected ICCP President

CHICAGO — The Institute for Certification of Computer Professionals (ICCP) announced the election of Roland D. Spaniol as its president at the eighth annual meeting of the board of directors in Orlando, Fla.

Spaniol has served on the Institute's board since 1978 and is director of marketing for R.V. Weatherford, Midwest Digital Systems Division, in Charleston, Ill.

Other officials elected at the Orlando meeting include Robert P. Campbell, president of Advanced Information Management, Inc., now ICCP vice-president; and Thomas W. Briggs, president of American Resource Systems, Inc., ICCP treasurer.

A Show of Friendship Computer Pros Invited to Tour China

LOS ANGELES — Computer professionals are being invited to visit China in August by the U.S.-China People's Association, a nonprofit, volunteer organization which promotes mutual understanding and friendship between the U.S. and the People's Republic of China.

The 12 persons in the group will have an opportunity to present papers and participate in seminars, while learning the latest developments in the computer industry in China.

Sightseeing Tours

Sightseeing and excursions to the Great Wall, the Forbidden City, museums and cultural exhibits and visits to Peking, Shanghai and other cities

will be included.

The tour will run from Aug. 2-21 and will cost approximately \$3,000 round-trip from Los Angeles. Interested indi-

viduals may apply by sending two copies of their resume by May 1 to Susan Dasso and Arthur Yin at 3422 Perlita Ave., Los Angeles, Calif. 90039.

Course Offers Hands-On Training In Solving Computer Fraud Cases

SAN FRANCISCO — Participants in a three-day workshop sponsored by the Assets Protection Journal will be given three previously unpublished computer-related frauds and instructed to solve them.

Participants will form fraud teams to work out investigative problems and formulate solutions, going through the

entire investigative process, including case preparation, the Assets Protection Journal said.

Other Presentations

In addition to case studies, workshop leaders and speakers will present information on the computer-related frauds process, investigative methodology and techniques and case preparation and presentation, the workshop's sponsor said.

The workshops will be held in Los Angeles, April 28-30; Chicago, June 8-10; New York, Sept. 21-23, and Washington, Sept. 28-30.

The three-day crime workshop is priced at \$575 per person, a journal spokesman said.

More information is available from Assets Protection, 500 Sutter St., San Francisco, Calif. 94102.

Computerworld can't cover NCC in one issue. That's why we're covering it in three.

We start with our April 27th National Computer Conference Preview Issue. Everything you need to know about the show before it's happened. We'll include the sessions, tell you who's speaking, review the exhibitors and what they'll be exhibiting. You'll even read about Chicago nightlife and where to go when you're not at the show. Extra issues will be distributed at the Computerworld booth at NCC. Black and white ad close is April 17th. Color close is April 10th.

Then our NCC Show Issue comes out May 4th, the day of the show. It will have last-minute show information, speech previews and other show details. Pick up a copy at the Computerworld booth. Black and white ad close is April 23rd. Color close is April 17th.

Finally, our May 11th NCC Wrap-up Issue will have complete coverage of all that happened, prepared by our 25-person editorial staff. You'll read who said what, who introduced what and how it works, and review the show's features and highlights in words and pictures. Black and white ad close is May 1st. Color close is April 24th.

Contact your Computerworld representative for complete ad details for any or all of these Special Issues. Or, to reserve ad space, call Frank Collins, at (617) 879-0700.



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Schedule Issued For 1981 Shows

BOSTON — Northeast Expositions, Inc. has announced its 1981 schedule for five regional National Computer Shows.

The first, The Southwest Computer Show, is slated for April 9-12 in Dallas.

The shows are trade and public exhibitions for manufacturers, OEMs, distributors, dealers and retailers of computer equipment.

The remaining regional shows are scheduled throughout the fall in Chicago, Washington, D.C., Boston and Atlanta.

Additional information is available from The National Computer Show, 824 Boylston St., Chestnut Hill, Mass. 02167.

Seminar to Cover Laws and Rights

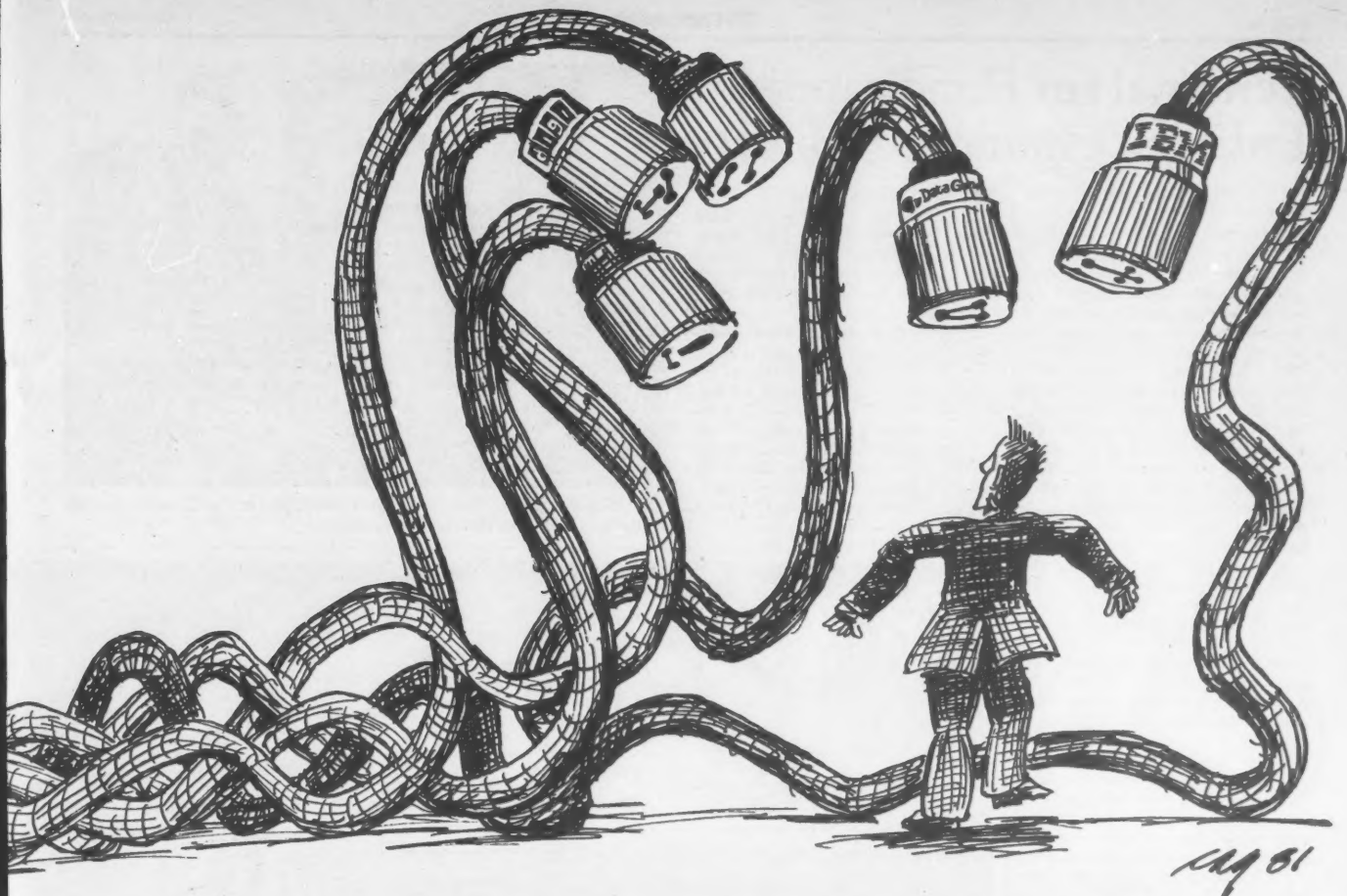
LOS ANGELES — The second annual Computer Law Institute, sponsored by the University of Southern California Law Center, will examine proprietary rights and computer contracts at a two-day meeting here on May 14-15.

The first day will emphasize the protection of proprietary rights in DP systems, including trade secrets, copyright and patent protection for software, chip technology and home computers.

Day two will focus on the procurement of DP products and services both from the seller's and user's viewpoints, according to the sponsors.

Information registration fees will be available in March.

Further information is available from USC Law Center, University Park, Los Angeles, Calif. 90007.



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Terminal for Handicapped Enlarges Character Size

By Deborah Wise

CW Staff

DETROIT — A partially sighted electrical engineering researcher has developed a computer terminal that displays characters up to eight times their original size so that partially-sighted and even legally blind people can work with the computer.

Dan Simkovitz, a researcher at Wayne State University here, realized that techniques devised for helping blind people use computers such as the machines that convert printouts into braille, are not necessarily suitable for the partially sighted, who do not always know braille. Therefore, he undertook to design a system, called the Low Vision Terminal System (LVTs), that helps solve the problems confronting the partially sighted who require enlarged letter sizes and a scanning facility in order to read a display screen.

Over the past two years Simkovitz has developed the LVTs using microcomputer-based technology. The design principle involves creating enlarged characters that pass across the display screen, thereby allowing the partially sighted operator to scan the words rather than read a still display. Unlike sighted people, the partially sighted are unable to read sentences at a glance because they only see the characters directly in their vision field.

Supported by a grant from the university and under the direction of Dr. Edward R. Fisher, the associate dean for research and graduate programs at the university, Simkovitz built his first prototype using an S100 microcomputer bus. Then he added a single-board program display module to cope with the additional circuitry needed to electronically generate the enlarged characters onto a connected closed-circuit television screen.

Special-Function Keys

In addition to a standard keyboard, Simkovitz designed a special-function key pad that controls the size of the characters and the scanning function. An 80-char. line, for example, can be displayed horizontally at the speed the controller wishes by depressing one of the special-function keys. When the line has been read the controller depresses the return key and the next line can then be scanned. There is also a vertical-scanning function key for tabular material and lists.

The character size can be adjusted from normal up to 3.4 in. to take into account different vision requirements. "I have run some tests with partially sighted people which were very favorable," Simkovitz said. He said he would like to see the system used to help the partially sighted work with computers in schools and colleges as an educational aid. He added that he thought it would be possible to adapt the technology to word processing, thereby making it possible for partially sighted people to take up secretarial and business positions.

Simkovitz said that a major benefit of the LVTs for the partially sighted is that it can increase reading speed from about one- to two pages of text per hour to 100- to 200 words per minute, thereby making reading a less tedious

and more enjoyable activity.

Although the technology has been tested at Wayne State, and the university is applying for a patent, at present there have been no offers from manufacturers to produce the LVTs commercially.

Simkovitz has conducted demonstrations for prospective manufacturers, but said the relatively low demand for the system (there are between 1.2 million to 1.9 million people with low vision in the U.S.) and comparatively high capital investment required to put it into production, has not made it an attractive commercial prospect. He estimated that it could cost \$2,500 to produce.



Dan Simkovitz and Dr. Edward R. Fisher, developers of a terminal for partially sighted operators, demonstrate their product.



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By Means of New Oil-Recovery Methods Program Helping to Restock U.S. Energy Pantry

By Bruce Hoard

CW Staff

COLORADO SPRINGS, Colo. — America's voracious appetite for oil has drawn computers into a complex effort to reach tough-to-tap tertiary petroleum supplies.

The Universities of Colorado (UC) and Southern California (USC) have mounted computer-aided programs that could each lead to the extraction of between five billion and 15 billion barrels of oil not recoverable through conventional procedures.

UC professor of chemical engineering W. Fred Ramirez is basing his efforts on the use of a detergent solution that, if sustained at the right pres-

sure in the proper amount of water, will dissolve the oil into the water or break it down, making it more mobile.

Before this "surfactant flooding process" can actually take place, however there must be a considerable amount of complex number crunching. That involves simulating the recovery process by computing a series of differential equations, according to Ramirez.

The researchers are using a Control Data Corp. Cyber 172 to compute what system variables are involved and the optimal mix of water, detergent and pressure. The program into which they plug their information was written in Fortran by graduate students at the school, Ramirez said.

Ramirez could not predict how much tertiary oil any given reservoir might surrender. "It depends on the reser-

The one-half million to one million additional barrels the method is expected to procure daily are only a Band-Aid over a gaping wound. It's not going to change our need for alternate fuel or overseas suppliers,' one USC professor commented.

voir," he said. "That is very much a function of the chemical properties involved in a given reservoir. They could change a great deal."

Although Ramirez and his students have been developing the software for four years, parts of it have been "basically unstable," he said. A recent breakthrough changed all that when "we made a series of assumptions developing a stable algorithm," he added.

The professor described the reservoir as a cylinder with water and detergent being poured into one end. As the concentration of the two changes, the tension between the water and the oil changes. Lower tension means more oil, he said.

Return on investment is, of course, very important for any oil companies that might use the process. For \$1 invested, the companies expect to gain \$2 in oil, the professor noted.

"When you put lots of money into the ground, you want to get a lot out," he said. He expects between five billion and 15 billion previously unreachable barrels of oil if the process is perfected and put to work. The U.S. currently has 27 billion barrels of oil reserves, according to Ramirez.

USC Simulation Program

Todd M. Doscher, professor of petroleum engineering at USC, thinks his steam-based extraction process could yield around 10 billion barrels over the next 10 years.

Like Ramirez and UC, USC depends on differential equations and computer simulation. Unlike the other researchers, however, Doscher farms out his computing to a service bureau and uses commercially supplied software.

"Reservoir simulation" involves knowing the physical laws that govern the behavior of steam in the ground and translating those laws into differential equations. The reservoir is broken up into "blocks" to which the equations are applied. Special programs may have to be written for the area around the drill bore, the professor said.

"This is a very involved and sophisticated type of analysis," he commented.

Doscher can get what he called a "history match" by developing a simulation routine, taking it to a pilot operation where oil is being extracted and adding actual results to the simulation.

"Then we go ahead and predict what's going to happen based on that and, of course, if we are lucky or right, we predict well," he said.

He acknowledged the one-half-million to one million additional barrels the method will procure daily are only a Band-Aid over a gaping wound. "It's not going to change our need for alternate fuel or overseas suppliers," he said.

(PLEX) to COBOL, PL/1, FORTRAN and Assembler. These extensions greatly facilitate their design efforts, freeing them to develop new applications as well as to update old. The Report Writer facility makes both on-line and batch reporting a routine and worry-free task. The discovery of PLEX's rich menu of powerful programming capabilities no doubt started the first bottle of champagne around.

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Now in Early Growth Stage Computer Cartography Maps Job Opportunities

By William M. Cowan
Special to CW

Computer graphics developed at an almost breakneck pace during the 1970s as the state-of-the-art progressed from large computer-aided design (CAD) systems to interactive minicomputer-based systems with TV-like terminals that can call up a chart or graph with pushbutton ease. In fact, computer graphics is now an estimated \$2.5 billion annual business worldwide.

Within this huge business area, specialized segments

such as computer cartography have already developed within their own right and are increasingly introducing special career opportunities.

Several hundred interactive computer cartography systems are already in operation, and many hundred more will certainly come on-line within this decade. Among the cartography disciplines in which the systems are being used are topological (especially for energy source exploration); sociological (demographics); environmental and land use (in-

cluding pollution control, agriculture and mining); utility and engineering drawings; management information; and surveying.

Growth Stages

Automated cartography is still in its early growth stage, according to Julius Dorfman who, with Eric Teicholz and several international associates, co-authored the definitive study *Computer Cartography: World-Wide Technology and Markets*.

Dorfman is the president of International Technology Marketing, Wellesley, Mass., consultants. Teicholz is associate director of the Laboratory for Computer Graphics and Spatial Design at Harvard University's Graduate School of Design.

"Government agencies, especially at the urban or municipal level, should offer a number of career opportunities," Dorfman said. "There are hundreds of urban agencies that need systems for planning, tax purposes, utility and street mapping and other applications."

"However, it may take five to 10 years for many of these potential users to acquire interactive computer cartography systems. Among the reasons for the delay are municipal budgeting and planning."

"Their efforts may be facilitated by the activities of federal government agencies. Agencies such as the U.S. Geological Survey, National Ocean and Atmospheric Ad-

ministration, Bureau of Census, Soil Conservation Service, Defense Mapping Agency Topographic Center and the Bureau of Land Management have already implemented major programs using computer cartography."

Cities such as Atlanta, Austin, Columbus, Ohio, Des Moines, Fort Collins, Kansas City, Los Angeles and San Diego, among others, have operational systems. The Atlanta project is a notable example of cooperative efforts among state and city agencies and privately owned power, natural gas and telephone companies.

Austin System

The Austin system has already been credited with enabling city agencies to update their maps more efficiently and to produce more useful maps. According to an *American City & County* article, the system is used in mapping electrical transmission and distribution facilities, identifying tax parcels, mapping water distribution and wastewater collection facilities and in plotting zoning data.

In planning for the Austin system, a study group estimated that the system would coordinate and improve the efficiencies of various departments and also cut drafting costs by 25%, saving \$159,000 per year in salaries and fringe benefits.

According to Julius Dorfman, "The need for draftsmen may be reduced, but career opportunities, requiring higher levels of skills and paying higher level wages, should

develop as further needs for computerized mapping and interpretation and management of the mapping data arise.

"Job or career opportunities are unlikely to be limited in computer cartography until the end of the century — if then."

"As late as 1976, only 15% of the potential users of all federal government agencies had programs involving interactive computer cartography systems under way."

"Only 5% to 10% of all municipalities, and less than 2% to 3% of the 3,000 counties, had systems."

"About the same could be said for utilities and general industry. Oil and gas exploration companies, engineering and construction firms, and universities had more systems in operation," Dorfman said.

Both Dorfman and Teicholz consider Canada the leader in developing and implementing integrated computer cartography systems and applications. Several major Canadian projects have been operational since 1965.

In Europe, 15 countries have on-going computerized cartography programs. A number of projects are also under way in Japan.

Resource-rich Mexico and Venezuela also have developed a number of programs. Mexico is probably the most active with projects being initiated by the federal government, universities and industry including Pemex, the national oil corporation.

Cowan is a free-lance writer based in Waban, Mass.

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IEEE Confers

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NEW YORK — The title of IEEE Fellow has been conferred upon 129 of its over 202,000 members, the Institute of Electrical and Electronics Engineers (IEEE) recently announced.

The new Fellows were chosen by a committee of their peers for their "outstanding technical and educational contributions, leadership characteristics and distinguished qualifications and experience in their particular fields," according to IEEE.

The 129 reportedly join 3,300 other Fellows who, as a group, comprise less than 2% of the total IEEE membership worldwide. Of the new Fellows, 104 are engineers from the U.S. and 25 are from nine other countries, including Brazil, Hong Kong, Australia, Switzerland, England and France.

Two of the 129 are women, bringing to 14 the total number of female IEEE Fellows.

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Computer Puts the Finger on Criminal Suspects

By Bill Laberis
CW Staff

MIAMI — Until recently, there was little chance that a telltale partial fingerprint left behind at the scene of a crime here would betray the crook who left it.

The problem was that a police detective would have to waltz the fingerprint or partial fingerprint through the police department's voluminous files, where some 350,000 sets of 10 fingerprints each are stored. Matching the crime fingerprint with a set in the file could take, conservatively speaking, 20- to 40-years of police work.

But a new computer system, guided by a highly specialized applications software package, can race through the fingerprint file in 10 minutes, spitting out a manageable list of suspects whose fingerprints might match those lifted from the scene.

Operational since January, Miami's fingerprint identification system, the newest of five such systems in the country, has already ferreted out 60 suspects in crimes dating back three years. The crimes, now well on their way to being solved, would likely have remained in the realm of the unsolvable, a police department spokesman said.

It is the system's ability to accurately match the partial or "latent" fingerprints with the files stored in the data base that sets it apart from other fingerprint identification systems, according to a spokesman for the Collins Division of Rockwell International, Inc., the system designer.

Ridge-Flow Patterns

The system uses specialized video hardware to read fingerprints on file and to determine the classification of each finger by extracting "minutia," or ridge-flow direction information. The ridge-flow patterns are numerically categorized, then stored in the data base.

"Basically, the video equipment converts the visual image data to x-y beta values for certain locations of ridges and flows of the fingerprints," police Sgt. Charles Nassberg said. "It computes up to 150 different digital values

for each finger based on where the ridges and swirls start and stop."

A latent fingerprint can be then be fed through the system, along with information on such variables as the finger it came from and whether the suspect is believed to be male or female.

The system scans the latent fingerprint and performs the approximately 10-minute search-and-match operation, yielding a suspect list of descending order, the prime suspects being at the top of the list.

What remains is hard-nosed police work, based on the simplified list of suspects supplied by the computer.

"It's hard to say just how accurate the system is, because we don't know the misses, only the hits," Nassberg said. "Provided that our file data and

inquiry data are adequate, it seems to perform well."

The \$1.5-million system uses a Digital Equipment Corp. PDP-11/34 plus Rockwell-designed special-purpose hardware for fingerprint processing. Rockwell also provided the systems integration and special software design.

Miami's system can handle up to 720,000 fingerprint entries in the data base, with increased capacity available with the purchase of more disk drives, a Rockwell spokesman said.

High-Demand Potential

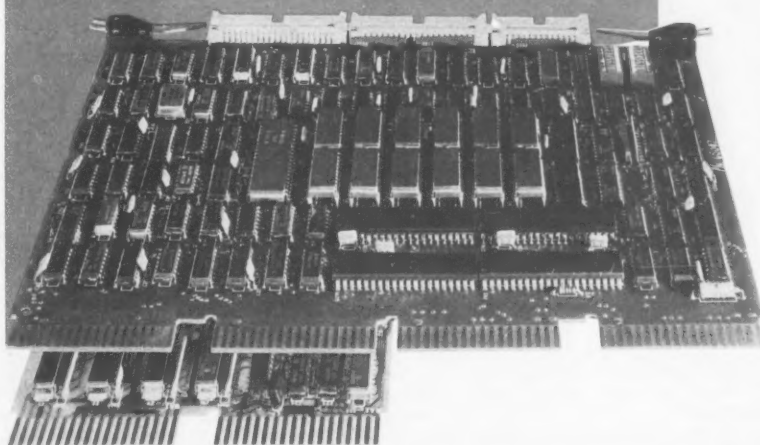
"Demand for this system is high — potentially very high — with virtually every identification bureau wanting to get its hands on one," Rockwell manager Edward Calvin said.

"But with municipal budgets in the fiscal squeeze they're in, it can be hard for police departments to justify the purchase. It's very difficult to determine the cost and benefit quantitatively. Additional crimes are certainly eliminated and additional investigators need not be used in pursuing criminals fingered by the system, that's for certain.

"It's the kind of situation that will probably lead to the system's being shared among neighboring communities," Calvin added.

The state of Minnesota currently operates a similar system with capabilities shared with the cities of Minneapolis and St. Paul. And Montgomery and George's counties in Maryland also share a system.

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Graphics Group Slates Conference for June

BALTIMORE — The 1981 National Computer Graphics Association (NCGA) conference and Exposition, scheduled to take place here June 14-18, is already four times the size of the NCGA's 1980 event, according to show sponsors at the Society of Manufacturing Engineers.

Companies holding the largest blocks of exhibit space are McDonnell-Douglas Automation Co., Computer-vision, Synercom, Applicon, Inc., Tektronix, Inc., IBM, Gerber Systems Technology, Inc., Auto-Trol Technology Corp., California Computer Products, Inc and Technical Marketing Productions. Approximately 50 sessions are planned for the conference, including a full day-and-a-half of tutorials.

Conference and tutorial fees vary, but exhibit-only admission is \$10. Additional information is available from the Society of Manufacturing Engineers, One SME Drive, P.O. Box 930, Dearborn, Mich. 48128.

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Students Get Eight-Million-Book Library Link

DE KALB, Ill. — Students working on a last-minute term paper can browse through collections totaling about eight million volumes from 16 academic libraries by simply going to one library here.

This feat is made possible by the Library Computer System (LCS), which links 17 public and private colleges and universities throughout the state. Established in late 1980 through funding provided by the Higher Education Cooperation Act, LCS is administered by the Board of Higher Education.

Basically, LCS automates the circulation of books and simplifies the borrowing of books from other libraries. It eliminates the need to fill out check-out slips, calculates book fines for overdue books and even keeps track of

books being "saved" on return for another patron.

A bonus the system provides is the "armchair search" for a particular book. The user types a search code for a particular library on the keyboard of one of the 275 terminals, which are either Hazeltine Corp. 1500 or IBM 3101 CRT terminals.

The user types in the author's name and the title of the book. If the item is in the collection of the library the student is using, the CRT screen will display such information as how many copies are available, where they are located and whether a copy is available for borrowing. If the book is not at this location, the user types in the search code for another library.

After the book is located, it can be

borrowed through a statewide delivery system that brings the volume from another campus, usually within three days. The user can also do a limited amount of electronic "browsing" by using another code to produce titles and authors of books shelved beside a particular volume.

Among the 17 participants in LCS are Northern Illinois University, the University of Illinois, Illinois State, Judson College, Lake Forest College, DePaul University, Catholic Theological Union and Illinois Institute of Technology.

LCS runs on the IBM 370/168 multi-processor at the University of Illinois' Circle campus, which has 14M bytes of main memory and 74 total spindles of IBM 3350 disk storage, nine of

which are used by this system. Page lists for book borrowing are produced by means of a Texas Instruments, Inc. 743 printer. The entire LCS network is anchored at the University of Illinois' Champaign-Urbana campus.

Free Newsletter Covers Job Mart

SPRINGFIELD, N.J. — A new monthly newsletter dealing with personnel and recruitment is available free to personnel directors and officers of other companies from the Recruitment Advertising Department of Keyes, Martin & Co., an advertising agency here.

"The Leading Edge" offers a digest of articles dealing with various aspects of employment gleaned from dozens of newspapers, magazines and trade publications in a variety of industries, the firm said. Some topics covered recently were "workaholics," fringe benefits, employee morale, salaries, vacations, work schedules, burnout, retirement, insurance, productivity and incentives for recruitment.

To receive "The Leading Edge," write on company stationery to Linda Rosenberg, Keyes, Martin & Co., 841 Mountain Ave., Springfield, N.J. 07081.

Brochure Out For Managers

NEW YORK — "An Introduction to Information Management" is a free brochure published by Clapp & Poliak, Inc. for people interested in learning about the science of information management.

The booklet outlines the nine basic elements of information management and their interrelationships: computers and programming, word processing, telephones, dictation and transcribing equipment, records storage and retrieval (including micrographics), copying and duplicating, electronic mail, typesetting and graphics.

"An Introduction to Information Management" is available from Clapp & Poliak, Inc., 245 Park Ave., New York, N.Y. 10167.

IWP Report Targets Use of Consultants

WILLOW GROVE, Pa. — "Guidelines for Selecting and Using an Information/Word Processing Consultant" has been published by the International Word Processing Association, (IWP). The report was compiled by a committee of word processing and office automation consultants for use by companies that plan to use consultants when reorganizing their office systems.

The brief report includes discussions of disciplines within the field, reasons for using a consultant, how to select a consultant and how to evaluate consultants' proposals, according to an IWP spokesperson.

To receive a copy, send \$1.25 to cover postage and handling to Dorothy Logan, IWP, 1015 N. York Road, Willow Grove, Pa. 19090.

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Up to 250% Differences Property Appraisal System to Ease Inequities

By Bill Laberis
CW Staff

NEW YORK — Homeowners in some of the poorer, more debilitated boroughs here have their ramshackle properties assessed up to 250% more than homes in the city's finer districts.

Such apparent assessment inequities have developed largely out of the city's inability to manually track and monitor the market forces affecting the values of its 550,000 single- and two-family homes.

But beginning this summer, the city assessors will join the Department of Finance in a computer crusade to eradicate the discrimination.

The ultimate goal is to build a functional Computer-Aided Mass Appraisal (Cama) program. Using the system, assessors and appraisers will be able to access accurate and pertinent real estate market information in minutes, information culled from a large data base to be developed over the next four years.

Cama is nothing more than an attempt to simulate what an appraiser from the assessor's office has always tried to do manually, according to Robert Kitchen, deputy director of the State Board of Equalization and Assessment in Albany.

Army of Assessors

New York state law demands that assessors in all the state's 933 cities and towns annually prepare assessment rolls at full market value. It is impossible, officials say, to visit and appraise each and every parcel every year without an army of assessors.

So, based on recent property sales in a given area, assessors make "guesstimates" as to relative property values, and levies are derived from these projections of market value property tax, officials explained.

But in a metropolis like New York, there is a flood of market information which must be analyzed to get an accurate picture of property values and the directions in which they are moving in any neighborhood.

In addition to recent sales portfolio information, city appraisers must assess general attributes such as proximity to a subway station, distance from schools, markets and police and fire stations and the like.

As many as two dozen market determinants, many variable over time, must be analyzed in an inner city environment to accurately assess property, experts claim.

Overassessment Problem

A recent report issued by the New York Public Interest Research Group (Nypirg) charged that two-thirds of the city's one- and two-family homes — most of them in the poorer neighborhoods — are overassessed.

"The city's data collection and analyses resources with respect to property assessments are archaic. There's just too much information out there to be handled manually," said Frank Domurad of Nypirg.

"To maintain assessment rolls accurately, the city has to go to some kind of Cama program. It's the only way to really know where market values are going, and therefore where assessments should go."

Around July 1, the city will begin manually collecting market data on 5,000 homes in the Bronx, expanding that number to 95,000 in the fall. Eventually information on all the city's 550,000 one- and two-family residences will be collected.

Regression Analysis

Once the data base is compiled and input to the system (except for annual entries of dynamic market data), it will be a relatively simple matter for an appraiser to accurately assess a home, based on the information stored on similar homes around it. In essence, the system will run a regression analysis using 18 to 20 market variables to

determine market value.

The data base will also support a host of other clerical and managerial functions, including the computerized production of the required annual assessment rolls and the processing and mailing of tax bills based on the assessments.

"The system will largely replace the hand-written paper entries compiled over the years by assessors, and will come to be an invaluable tool," said Paul Canick, deputy finance commissioner in the city's Department of Finance.

"When you're working with this many properties, a Cama application is the one and only way to ensure tax and

assessment equity," he said. "It will make maximum use of existing manpower."

Canick said the pilot phase of the program, financed by a modest \$30,000 in city funds, will be run on hardware from Datapoint Corp. The system will be upgraded with \$8.3 million in state funding to accommodate the eventual growth in the data base, he added.

The state currently runs Cama programs serving over 200 communities using its Burroughs Corp. B7800 dual processor tied to a network of Burroughs B6800s in regional offices across the state.

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MGM Grand Hotel Automates Fire System

By Lois Paul
CW Staff

LAS VEGAS — Eight months after it was damaged by a fire that killed 84 persons, the MGM Grand hotel-casino here will reopen in July with a computerized multimillion-dollar fire detection and control system.

The new system will be able to monitor 1,300 locations throughout the hotel and automatically activate up to 1,000 life safety functions to halt the spread of fire or smoke and help guide hotel occupants to safety, according to the hotel officials.

All of the fire detection and control functions will be operated from a 28 ft by 40 ft computerized control room, which will be staffed 24 hours a day and located on the casino level. The

sprinklers, smoke and fire detectors will be tied into a Modular Computer System, Inc. Modcomp J-II CPU with 64K word core memory.

The system is being installed by Johnson Controls, Inc. and there will be an identical Modcomp J-II to provide backup and dual CPU capacity. The control room will be protected by a two-hour firewall, have its own telephone system and emergency power supply and provide direct outside access for firefighters.

Information about the source of a fire will appear instantly on the Johnson Control DO/6 and KB/1 CRT terminals, a Johnson Control Model 43 printer and a large display board. Two sets of transmission lines, one of which serves as a backup, connect the

computer with data gathering panels throughout the hotel.

Communication Zones

The entire hotel will be divided into communication zones. A smoke, sprinkler or manual alarm will activate a loud, steady tone to warn occupants on the fire floor and the floors above and below. There will be 8,000 speakers throughout the hotel, including one in each guest room.

From the central control room fire authorities will be able to interrupt the tone and provide safety or evacuation instructions to any room, area or even the entire hotel at one time. Phone jacks located at each stairwell and emergency exit will enable firefighters to plug in hand phones and maintain

voice communications with the central control room.

A bank of switches in the control room will be able to activate large fans while opening and closing appropriate dampers to bring in fresh air and remove smoke from a fire without recirculating it through the hotel. Within 10 minutes, this purge system reportedly can exchange part or even all the air inside the hotel complex.

According to Steve Sayles, product manager at Johnson Controls, installation of the system will be completed by June 1, so it will be fully operational by the MGM Grand's planned July 1 official reopening.

Administrators In Philadelphia Learning DP

PHILADELPHIA — The city of Philadelphia is training its middle- and top-level administrators in "computer literacy" to help them understand the computers and the computer applications their departments use.

The two-day courses include hands-on experience with microcomputers and reportedly teach the capabilities of computers rather than programming skills.

"There is a lot of participatory activity and we see it primarily as a means to begin to overcome the resistance people have to computer projects," said John Schott, training consultant with the city of Philadelphia's training department. "The results have been very positive," Schott added.

The course is administered by Executive Training Associates, Inc. (ETA), Allentown, Pa., who have worked on its development over the last two years. The company takes its own microcomputers to the city's offices to take part in the training sessions.

"We emphasize combining management training techniques from the behavioral sciences with the latest in microcomputer technology," said Edward B. Yarrish, managing associate with ETA.

The course costs \$110 per city employee and is paid out of the different city departments' budgets. Schott called the fee rather high, but said there was a waiting list for the courses.

More information is available from ETA, 1709 Hamilton St., Allentown, Pa. 18104.

Ifip Gives Allan Silver Core Award

DALLAS — The International Federation for Information Processing (Ifip) has presented its Silver Core Award this year to Dr. John J. Allan III, president of Productivity International, Inc., a Dallas-based publishing and consulting firm specializing in robotics, turnkey and computer-aided design and manufacturing (CAD/CAM) systems.

The award was given to Allan in recognition of his contributions to the Ifip organization as vice-chairman of a working group on computer-aided design from 1977-1980 and as U.S. representative to the Ifip technical committee on computer applications in industry.

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Frank J. Sanzone, Jr., is Assistant Director of Finance, Carroll County General Hospital, Westminster, Maryland. Robert Monogue is an NCR Representative.

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For Overworked Managers TV Computer Course to Crack Literacy Barrier

By Bill Laberis
CW Staff

COLUMBUS, Ohio — From the comfort of an overstuffed recliner, business managers and others in the Greater Columbus area will have the opportunity to crack the computer literacy barrier and earn two college credits as a bonus.

The six-lesson course, "Computer Basics for Management," will be beamed over the Qube interactive cable television system here beginning March 30. The target audience consists of those managers who have had neither the time nor inclination to acquire a comprehensive understanding of DP functions and machinations.

Both Warner Amex Cable Communications, Inc., which operates Qube, and the American Management Association's Extension Institute are co-sponsoring this first TV effort.

What sets this course series apart from previous education-for-credit television programs is that students will interact directly with the studio via studio-linked response buttons.

"It will be our first opportunity to take our course material into the home for the manager who doesn't have the time to come to us," association spokesman Joseph Keyes said. "If this experiment is successful, it could be a tremendous breakthrough for management-education organizations like

ours, an opportunity to convert seminar and course material into this kind of interactive television format."

Qube in Columbus is currently the only two-way interactive television system in operation, although similar systems are being constructed now in Pittsburgh, Pa., Houston, St. Louis and Cincinnati.

In Demand

Keyes said the basic computer literacy course was selected for the pilot run because of the "increasing popularity and demand for the material covered."

"Managers today have to know that, whether they like it or not, whether

they want to or not, they are going to have to relate with a systems professional at some point in their business, and they'd better know what they're talking about," Keyes said.

Business professor William J. O'Neill of Villanova University will instruct the course series. He said the material will include information on business file creation and use, basics of Fortran programming, elements of distributive data processing and an analysis of the costs and benefits of advanced business systems. His instruction will be supplemented by a specially designed text and other support materials.

The subscribers' cost for all six courses is \$85, and two Continuing Education credits will be awarded to students upon successful completion of the course.

Program Wins Othello Tourney

PITTSBURGH, Pa. — A computer program called Iago, the product of graduate-level studies in artificial intelligence at Carnegie-Mellon University here, beat 20 other programs in an international computer Othello tournament held recently in California.

Paul Rosenbloom started working on the program as a hobby, but was able to integrate it into his study of artificial intelligence because the kind of well-defined tasks the game of Othello requires are relevant to other areas of artificial intelligence research.

Iago, which is written in Sail, a language developed in the early 1970s by the Stanford University artificial intelligence laboratories, both searches for possible moves and judges the value of the moves and the positions in the game. Apparently, it can provide several reliable measures of the relative worth of different Othello positions.

Although the current human world Othello champion, Jonathan Cerf, was at the computer tournament, he declined to play against the computer program. He did say he doubted if he would be able to defeat it.

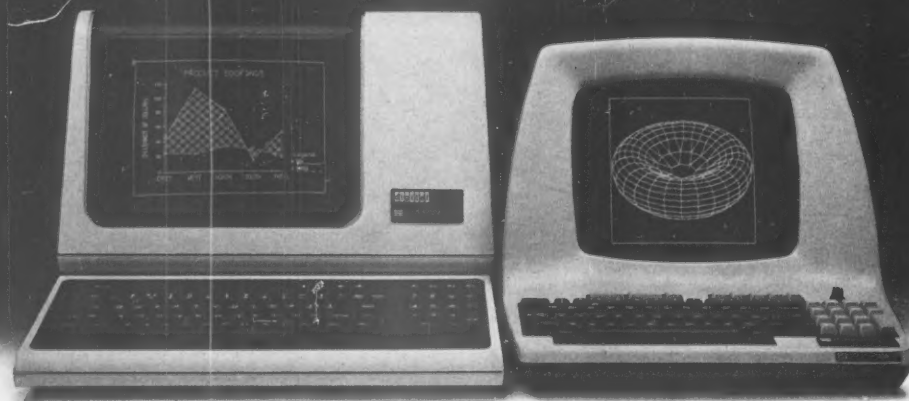
Keystroker Awarded Data Entry Prize

LAKEWOOD, N.J. — Betsy Ann Gawrilenko of Spencer Data Processing Systems produced more than 22,000 keystrokes in an hour to win the \$250 first prize in a competition sponsored by the Data Entry Users of Delaware Valley, headquartered here.

More than 70 entrants from the 30-member companies of the users association took part in the annual competition. The association was started in 1976 to promote the exchange of information about general management approaches to the data entry side of DP.

The association holds nine meetings a year that feature speakers who address various problems and techniques of data entry management. The dues of \$40 per year per company entitles the company to send as many employees as want to go to the sessions. More information is available from E. Feist, Publicity Chairman, SDPS, 1720 Oak St., Lakewood, N.J. 08005.

The Idea Is Retro-Graphics.



Retro-Graphics is quite literally changing the face of the display terminal marketplace. Because the line of graphic enhancement products that carries the Retro-Graphics name transforms some of today's most popular alphanumeric terminals—the DEC® VT100® terminal, for instance, and Lear Siegler's ADM-3A and 3A+ Dumb Terminal® products—into terminals that feature full graphics capabilities.

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Calendar

April 26-May 1, Kansas City, Mo. — **Technical Leadership Workshop.** Contact: Ethnotech, Inc., P.O. Box 6627, Lincoln, Neb. 68506.

April 27, Waltham, Mass. — **Starting and Managing a Successful Computer Company.** Contact: Center for Continuing Education, Bentley College, 311 Beaver St., Waltham, Mass. 02254.

April 27-28, St. Louis — **Successful Selection of Minicomputers.** Contact: Stephanie Gaubatz, Program Manager, RHY Consultants, Inc., P.O. Box 21026, St. Paul, Minn. 55121.

April 27-28, San Jose, Calif. — **The Home and Business Video Information Services Market.** Contact: Alenne Glock, Strategic Business Services, Inc., Suite 215, 4320 Steven Creek Blvd., San Jose, Calif. 95129.

April 27-28, San Francisco — **The ADA Programming System.** Contact: Software Research Associates, P.O. Box 2432, San Francisco, Calif. 94126.

April 27-28, Denver, Colo. — **User's Guide to Systems Development.** Contact: BSI, 4720 Montgomery Lane, Bethesda, Md. 20014.

April 27-29, New York — **Data Communications: An Introduction to Concepts and Systems.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075. Also being held April 29-May 1, Los Angeles.

April 27-29, Chicago — **Information Systems Planning: A Structured Approach.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

April 27-29, Washington, D.C. — **Systems Analysis and Design: Advanced Techniques.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

April 27-29, Chicago — **Cryptography and Data Security.** Contact: Hellman Associates, Suite 307, 299 California Ave., Palo Alto, Calif. 94306.

April 27-29, Boston — **Minicomputer Systems: Guidelines for Successful Selection, Acquisition and Operation.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

April 27-31, Washington, D.C. — **Structured Systems Design/Structured Requirements Definition.** Contact: Ken Orr and Associates, Inc., 715

E. 8, Topeka, Kan. 66607.

April 27-May 1, Atlanta — **Comten Users Exchange.** Contact: Marilyn Cianciolo, General Motors Research Labs, GM Technical Center, Warren, Mich. 48090.

April 27-May 1, Washington, D.C. — **Structured Programming and Software Engineering.** Contact: Director, Continuing Engineering Education, George Washington University, Washington, D.C. 20052.

April 27-May 1, Detroit — **Systems Analysis Workshop.** Contact: BSI, 4720 Montgomery Lane, Bethesda, Md. 20014.

April 27-May 1, New York — **Structured Analysis and Design Workshop.** Contact: Tony Formica, Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

April 28, College Park, Md. — **Automated Tools for Software Engineering.** Contact: Laverne Papian, Washington, D.C. Chapter Association for Computing Machinery, 1000 Connecticut Ave. N.W., Washington, D.C. 20036.

April 28, College Park, Md. — **Technical Managerial Aspects of the Electronic Office.** Contact: Laverne Papian, Washington D.C. Chapter Association for Computing Machinery, 1000 Connecticut Ave. N.E., Washington, D.C. 20036.

April 28-29, New York — **Upgrading Your Office Communications Systems for Electronic Mail/Electronic Message Systems.** Contact: Customer Service, Bob Sanzo, Marketing Director, 106 Fulton St., New York, N.Y. 10038.

April 28-29, King of Prussia, Pa. — **The Greater Delaware Valley Office Systems Expo.** Contact: National Trade Productions, Inc., Suite 300, 9301 Annapolis Road, Lanham, Md. 20801.

April 28-30, Ottawa — **Showcase '81.** Contact: Data Processing Institute, Box 2458, Station D, Ottawa, Canada K1P 5W6.

April 28-30, Paris — **1981 International Telecommunications Forum.** Contact: Dusty Rhodes, Arthur D. Little Decision Resources, Acorn Park, Cambridge, Mass. 02140.

April 29-30, New York — **Managing Structured Projects.** Contact: Tony Formica, Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

April 30, New York — **Introduction to Computer Graphics.** Contact: STSC, Inc., 747 Third Ave., New York, N.Y. 10017.

April 29-May 1, Chicago — **EDP Project Management: A Practical Approach.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

April 29-May 1, Washington, D.C. — **Automating Your Office Today: Planning and Implementation Methods.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

April 29-May 1, San Francisco — **Advanced EDP Management: Methods and Techniques in the '80s.** Contact: Seminar Department, Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

April 29-May 1, Troy, Mich. — **1981 DPMA Region Nine Spring Conference, "Management in Action."** Contact: DPMA Detroit Chapter, P.O. Box 1226, Detroit, Mich. 48231.

April 30, New York — **Introduction to Computer Graphics.** Contact: STSC, Inc., 747 Third Ave., New York, N.Y. 10017.

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Call for Papers

SECOND INTERNATIONAL CONFERENCE ON INFORMATION SYSTEMS, Bos. on, Mass., Dec. 7-9.

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curriculum issues in MIS, public policy and societal aspects of computing.

Full papers must be received by the program chairman by May 15. Notification of acceptance will be made by July 1. Papers should be no longer than 25 pages, including the abstract and all illustrations, tables and references. They should follow the format for papers published in either *Management Information Systems Quarterly* or *Communications of ACM*. Authors should submit three copies of the paper to Program Chairman, Center for Information Systems Research,

Sloan School of Management, MIT, Cambridge, Mass. 02139.

EFOC '81, Cologne, West Germany, November 4-6.

Information Gatekeepers, Inc. has issued a call for papers for EFOC'81, the Second European Fiber Optics and Communications Exposition. The EFOC'81 technical program will feature as its main focus "Fiber Optics in the Local Area Network." Papers are invited in the following categories: Fibers, cables, couplers, sensors, detectors, wave-length division multiplexers, integrated optics, multiplexers, applications, local area networks, video

distribution, telephone, integrated services and switching.

Prospective authors should submit 200-word abstracts by April 15. More information is available from Michael A. O'Bryen, General Manager, Information Gatekeepers, Inc., Suite 111, 167 Corey Road, Brookline, Mass. 02146 or Hawley Russell, 30-32 Rue Cortambert, Paris 75016 France.

ACM-SIGUCC USER SERVICES CONFERENCE, Sheraton-Atlanta Hotel, Oct. 11-14.-14.

Appropriate topics include consulting for micros & minis, network consulting, video disk applications

and advances in text processing.

A one-page abstract is due April 1. Authors should mail abstracts to Box 654, Georgia State University, University Plaza, Atlanta, Ga. 30303.

COMPUTER GRAPHICS '81, Regent Center Hotel, London, Oct. 27-29.

Computer Graphics '81 is jointly sponsored by Computer Graphics World and Online Conferences Ltd.

Authors should send a 200-word summary by May 7 to Patti Trigg, Online Conferences Limited, Argyle House, Northwood Hills, HA6 1TS Middlesex, UK.

IEEE Announces Course Offerings

NEW YORK — The Educational Activities Board of the Institute of Electrical and Electronic Engineers, Inc. (IEEE) has announced a one-day course on minicomputer and microcomputer applications April 29 in Cleveland and a two-day seminar on microprocessors April 30-May 1 in Atlanta.

The microprocessor seminar includes a look at competing technology and a sampling and description of interfacing chips.

The minicomputer and microcomputer applications course is designed for those who have some knowledge of the field.

Registration for the microprocessor seminar is \$230 for IEEE members and \$290 for nonmembers and registration for the minicomputer and microcomputer course is \$160 for IEEE members and \$205 for nonmembers. More information is available from the IEEE Continuing Education Department, 445 Hoes Lane, Piscataway, N.J. 08854.



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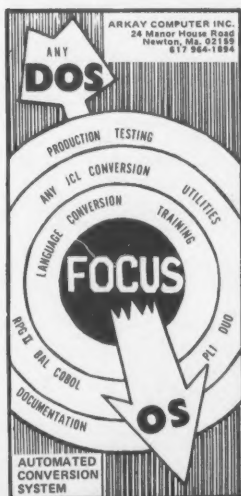
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EDITORIAL

Losing Control

A series of articles on what computing does to the quality of local governments begins in this issue. According to the Urban Information Systems (Urbis) Research Group, whose latest book forms the basis of these articles, local government computing is "inherently undemocratic," reinforcing a city's dominant political coalition and excluding "many legitimate interests."

The Urbis team's book, *Computers and Politics*, will be published in the coming year by Columbia University Press as a sequel to *The Management of Information Systems*, available now from the publisher for \$25. In 1979, *Computerworld* ran a series of articles summarizing portions of this earlier work, relating such conclusions as:

- "Many U.S. mayors and city managers are disappointed with the results of computerization."
- "Government at all levels has automated in blithe ignorance of computing's impact on people and organizations. Some bureaucrats are fanatical in their conviction that computing is a cure-all."
- Some cities have allowed a "technocratic elite" to dominate policymaking.

Both Urbis books are disturbing, provocative and worth the attention of anyone concerned with the effects various strategies for systems implementation can have on the quality of life.

Computers and Politics should be valued as an indication that the public, as a direct consequence of computer applications, is losing control over government. Systems have improved efficiency and cost-effectiveness in many cities and counties, Urbis pointed out, but that does not mean local governments were made more responsive to public needs.

The Urbis team was funded by the National Science Foundation as a function of the University of California at Irvine's Public Policy Research Organization (PPRO). The team's conclusions reflect intensive on-site investigations of computing at 42 U.S. cities during the past several years.

These cities, considered representative of the nation's local government, include: Albany, N.Y.; Atlanta; Burbank, Calif.; Evansville, Ind.; Grand Rapids, Mich.; Las Vegas; Louisville, Ky.; New Orleans; Philadelphia; Quincy, Mass.; Spokane, Wash.; and Tulsa, Okla.

The present series of articles will cover how computing has fared at some of these cities; how politicians use computers to convince people that policies are especially "rational"; the "data wars" waged with computers in local governments; how policymakers view DP professionals; and, finally, an overview of the four historical stages of local government computing with speculation about the future.

With *Computers and Politics*, PPRO has once again made an important, commendable and stimulating contribution to studies of what computing does to the world. The University of California at Irvine institute has presented considerable evidence that the technology is changing political relationships, regardless of whether professionals in the technology understand or even care about this process.

DATA PAST

Five Years Ago
March 29, 1976

COLUMBUS, Ohio — The Singer Business Systems users group presented a statement to TRW, Inc., caretaker of Singer's user base, touting the features of the System 10 and urging TRW to continue producing it. Users were concerned that TRW would stop manufacturing the system after Singer's five-year commitment to supply parts for installed systems.

Ten Years Ago
March 31, 1971

CHICAGO — A federal grand jury began investigating the disappearance of more than 2,800 railroad boxcars on railroads throughout the country. According to U.S. attorneys here and in Philadelphia, someone had to "put the fix" on Penn Central Railroad's computers to shuttle at least 217 boxcars to a tiny downstate Illinois railroad and "make them disappear."



LETTERS

Women in Management

In order to help Jeffrey S. Jolly and others with similar misconceptions broaden their experience ["Few Want Top Slots," CW, March 9], let me explain that there are many women who are eager to get into DP management. I am one of them, with an M.B.A. (obtained at night while working full-time as a systems analyst) and a Certificate in Data Processing (CDP). I have no fear of accepting the responsibility involved in DP management.

There are several women in my organization with similar skills and growing numbers of younger women quite eager to gain them.

One interesting fact is the ratio of women to men in the "Introduction to Data Processing" course I teach at a local community college: 42 women to 19 men.

I think Jolly has had particularly limited experience.

Sharon Chandler Weisman
Los Angeles, Calif.

Short on Accuracy

The accuracy of the March 9 Taylor Report ["Codasyl Shut Door on Users' Complaints"] did not even last beyond the first word.

I will leave the more detailed criticism of that article to my distinguished colleague Don Nelson (not David), chairman of the Codasyl Cobol Committee.

Jerome Garfunkel

Great Neck, N.Y.

Table Was Wrong

The large number of high-end mini-computers (so-called "superminis") has generated the need for accurate comparative performance data for users to make intelligent choices. The table "Comparison of 32-Bit Minis" [CW, March 9] was therefore quite interesting to me.

The first thing I noticed was that the

Prime Computer, Inc. 750 seemed out of line in price/performance. A little checking uncovered the problem: the table is wrong.

The performance in Whetstone benchmark runs for the Prime 550 was understated in the table, but the performance for the 750 was grossly understated (based on Prime's figures).

In addition, the price for the 750 is lower than shown in the table. The description of the configuration is ambiguous in that it just says "terminals," not how many. It takes quite a few terminals to make the Prime 750 cost \$241,000, as shown in the table. It is also strange that 2M bytes of main memory (an unusually large size to me) was used for the sample configuration.

When reading the "fine print" I found that the entire table was prepared by Perkin-Elmer Corp. which, of course, has an advantage in selecting a configuration that makes its equipment look best and has no advantage in running benchmarks on competitors' equipment in the most efficient way.

While I think it is perfectly valid to publish manufacturers' claims for their equipment and to publish independent comparative results, I think it is bad editorial policy for *Computerworld* to publish vendors' performance data about their competitors' equipment without independent validation.

Kevin W. Davidson

Easley, S.C.

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READER COMMENTARY

Pender M. McCarter

Nations Seeking Limits On Transborder Data Flow

Developed and developing countries are uniting in promoting a new, restrictive body of international law on transborder data flows. This disturbing conclusion is suggested by recent developments such as the United Nations Educational, Scientific and Cultural Organization (Unesco) Plenary Session, held last fall in Belgrade, Yugoslavia; the MacBride Commission Report, presented at Belgrade; and Venezuela's U.N. Draft Resolution, presented in the General Assembly last December.

Though most media coverage about the Unesco Plenary Session concerned access to news sources, the MacBride Commission Report stated:

"The flow of technical information within nations and across national boundaries is a major resource for development. Access to such information, which countries need for technical decision making at all levels, is as crucial as access to news sources. This type of information is generally not easily available and is most often concentrated in large techno-structures. Developed countries are not providing adequate information of this type to developing countries."

Basic Recommendations

The report then recommended:

- Developed countries should foster exchanges of technical information on the principle that all countries have equal rights to full access of available information.

- Developing countries should adopt national informatics policies as a matter of priority. These should primarily relate to the establishment of decision-making centers (interdepartmental and interdisciplinary) which would, among other things, (a) assess technological alternatives, (b) centralize purchases, (c) encourage local production of software and (d) promote regional and subregional cooperation.

- Transnational corporations should supply to the authorities of the countries in which they operate, upon request and on a regular basis as specified by local laws and regulations, all information required for legislative and administrative purposes relevant to their activities and specifically needed to assess the performance of such entities.

New World Order

Through implementation of these recommendations, the Third World actively seeks to redress an imbalance in data flows with a corresponding loss (to the Third World) of jobs, revenues and autonomy. This is being referred to as establishment of the new world information and communications order. From the developing nations' standpoint, this new world information order must lead to a new world economic order with a more equitable distribution of all resources.

While the Third World seeks "equal access" to worldwide data networks, it

(Continued on Page 62)

SOFTLINE/Werner L. Frank

Software Is Leverage

One would almost conclude from all the gloom about software productivity pervading our industry that hardware is the clean-cut winner in the cost-effectiveness race. Yet software can yield an enormous amount of economic leverage for a dollar spent.

Consider the following example. A user evaluates the benefit of providing on-line programming support facilities to the DP staff. It is determined that 84 programmers can substantially enhance their productivity in sharing 21 on-line terminals by employing software products such as Applied Data Research, Inc.'s Roscoe and The Librarian.

The decision is made to proceed. The existing DP installation is augmented by the necessary hardware, including the terminals as well as the necessary communications controllers. The newly generated incremental costs per month are found to be \$535 for software and \$4,098 for hardware — or almost a one-to-eight ratio in new obligation. In other words, to further exploit the computer, an expenditure of \$1 in software required \$8 more of hardware cost.

One concludes from this single case the following:

- 1) Software is very inexpensive relative to hardware.
- 2) Software creates a substantial hardware market.

In this sense, software has an inherent leveraging capacity benefiting the hardware marketplace.

As a second example, consider the In-

formatics, Inc. software product Shrink, which automatically compresses data files for more economical recording of information on disk and tape storage devices. Compression can range from a conservative 50% to as high as 90%, depending on the specific file characteristics.

For an initial product purchase commitment of \$30,000, users have achieved typical savings of \$5,000 monthly in unneeded disk spindles or tapes. One user, with enormous files, displaced 40 spindles at an annual saving of more than \$500,000, while a second has achieved savings of more than \$1 million per annum.

In other words, the cost of the software is paid back in a few months, with subsequent bottom-line payoff which staggers a return on investment calculations. Investment returns such as this are uncommon and suggest that the commercial software marketplace is due for a massive pricing correction. We offer note:

- 3) Commercial software is tremendously underpriced and can be a bargain.

Added Benefits

But benefits in this case do not stop here. In addition to disk storage savings, the user also has the potential for achieving better CPU utilization, faster throughput performance and lower cost in handling, management and maintenance of the storage units themselves. In another reported case, such

(Continued on Page 67)

READER COMMENTARY/Howard Fosdick

The Student's View of On-Campus Recruiting

With the recruiting and retention of qualified personnel the foremost concern of many information system managers, on-campus interviews with graduating students have become increasingly important. Competition for the available grads can only be described as fierce.

What can an interviewer do to generate interest in the positions he offers? And what is it that attracts the college graduate to the position he accepts?

As a fairly recent graduate (M.S., 1979), I'd like to discuss these questions based on my own experiences during the interviewing process. Although the opinions expressed can only be my own, there are few simple facts that can aid the interviewers who know them. I'll concentrate on these most helpful bits of information.

The first fact potential employers should recognize concerning on-campus recruiting is that employment interviews are nearly a year-round event at most schools. It is no longer true that most seniors graduate in May or June. Significant numbers of graduates seek employment in December and January and even at the end of the summer term(s).

There are several reasons for this. First, there has been a fundamental change in the traditional, structured pattern of matriculation because of

changes in students' attitudes, increased emphasis on summer school and the trend toward allowing students to receive college credit for advanced high school courses.

Second, there is the currently favorable market for computer science graduates. Students often take advantage of the shortage of DP personnel to interview with more employers over a longer period of time. The net effect is that interviewing is a continuous process and is no longer confined to the spring season.

Potential employers should be aware of the peak interview periods that still exist at many schools, but recognizing that students are looking for employment throughout the year can lead to more interview opportunities for a company.

Know the Curriculum

Knowing something about the curriculum of the school can be an aid to the interviewer as well. You should know, for instance, whether the school is oriented toward training programmers for industry or whether the program is more theoretical. Is the B.S. degree considered an end in itself? Or is the curriculum oriented toward the Ph.D., with the B.S. and M.S. merely considered preparatory steps along the way?

Employer awareness of the nature of

the curriculum is helpful to both the student and the employer. From the student viewpoint, it is rather disappointing to find that an interviewer has no idea that the school specializes in computer engineering, for example. Most of the interview is then wasted "filling in" the potential employer on the character of the computer engineering curriculum, information the company might have already known.

In my own case, the school gave students hands-on experience with IBM software. The training included programming practice with IBM access methods, operating systems and programming languages. When talking with some interviewers, I felt my education was undervalued because they assumed all universities taught only "theoretical" computer science. Those interviews, therefore, mainly consisted of my explaining the nature of the school's unusual attitude toward industrial DP.

The interviewers may have left appreciating the value of the curriculum, but I left wondering why some employers had come to interview in the first place.

From the company standpoint, some knowledge of the school's computer science curriculum is invaluable. If the program is based on DEC equipment, you can hardly expect experience on

Univac hardware — that is, unless you feel there is a reasonable possibility some students have gained that experience through summer jobs or that some students (particularly graduate students) will have had that experience in previous employment.

Intern Programs

Perhaps the best way to become familiar with the value of a school's graduates relative to your company's needs is to offer to hire that school's students as summer interns. Most schools support such programs in one form or another, often providing credit for students who participate.

Of course, the students also have plenty of incentive from the monetary standpoint. For many, a salary of anything more than \$1,000 a month is more than they have ever had a chance to earn before. Most important from the company viewpoint is that you'll be able to gain familiarity with the school's curriculum and its value to your company.

Furthermore, you'll gain personal (and possibly continuing) relationships with those students who perform well in your environment. And, if the intern program works well, you can establish a long-term relationship with the university involved.

(Continued on Page 68)

On Cobol-80

Although my feeling on the use of the ALTER verb is unprintable, we do have about 100 programs in our shop that use it to one degree or another.

In my opinion, technical committee X3J4 must have their heads up their duffel bags. Upward compatibility from Cobol-74 to Cobol-80 must be supported. We have enough things to do without adding this foolish thing to the list.

I endorse the position of Traveler's Insurance Companies.

Tim Menton

Wilmington, Del.

Percent of What?

In the March 9 letters column, Leon J. Panko asked: "If I estimate something to be 100 units and it results in 226 units, by what percent did I un-

derestimate the number of units?"

My question is: Percent of what? Percent of the estimated value or the actual value? The underestimation of 126 units is 126% of the estimated value and 56% of the resulting value. The choice between the two figures must depend upon the use to which the percentage will be put.

A similar confusion exists in retail sales. If a retailer buys something for \$6 and sells it at \$10, is he working on a 67% or a 40% markup? Most retailers are used to dividing the "gross revenue pie" into the appropriate slices (for example, 60% cost of goods, 10% rent, 13% salaries and so on) and will consider the example to be 60% cost of goods and 40% markup.

LETTERS

The answers to these questions will not rest on axiomatics, but on pragmatism.

Jerrold R. Goodwin

Berkeley, Calif.

That's Incredible

In regard to the front-page article "First Large-Scale Computer..." [CW, March 2], I wish the author would elaborate as to how those U. Penn. students were able to get their TRS-80 to square all integers from 1 to 10,000 in one-third of a second. Now that's incredible!

I too have a TRS-80, and it took my machine more than 90 seconds to perform the task. Here's my program:

```
10 FOR X = 1 TO 10000
20 LET N = X * 2
30 NEXT X
40 PRINT X,N
```

Where did I go wrong?

John Graney

Gowrie, Iowa

Take Prayer Seriously

Add my nod to reader Jill Rodick's March 2 letter regarding puns on prayer.

There are those of us who take prayer seriously and wish ad copy writers would too.

John J. Stewart

Wausau, Wis.

Happily Ever After...

Consider the plight of the gentleman, who, having lost his servants through the vagaries of time and through no fault of his own, refuses to clean his own house. After all, he was not brought up to do such menial duties.

For the first year he does sufficiently well. The dust settles, but he has linen and crockery and silver enough. The cooking can be avoided by sending out for pizza.

But what then? What ever will be done with these stacks of dishes and mountains of soiled napkins and underwear?

Well, what happened was, the gentleman took up a peripatetic existence, settling into a new house each year, a house with closets full of clean underwear and dishes. When he had used up all the houses in his home town, he had to move to the city and become a programmer to support himself.

Since computer programmers never change their clothes anyway and exist on coffee and pizza brought into their work, he had no more troubles and lived happily until he died.

Roger Eaton

Los Angeles, Calif.

Serious Subject

"Superzap," "Trojan horse," "logic bombs" and "salami techniques" are indeed colorful terms. All have specific technical definitions, which the author of the recent article about them [CW, Feb. 9] did not provide.

Superzap, for example, is a utility program (often provided by a mainframe vendor) used to patch programs or data on disk (or sometimes in memory) in hexadecimal. It does not "bypass all the controls of a system by activating the mainframe's own emergency master program" (whatever that means) nor could it be used to "bring even the most technically secure computer to its knees."

The article quoted Jack Bologna giving a description of the typical computer thief ("white males between 19 and 30 with no criminal record and more dedicated to profession than employer") which, he admits, fits 90% of all DP professionals. It continued to warn against the "menopausal set... and divorce candidates."

Clearly to be shunned are 19-year-old divorced males undergoing menopause.

Comic book definitions of computer terms and pseudosociological crime fighting trivialize the very real issue of computer security.

Gabriel Goldberg

McLean, Va.



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THE HUMAN CONNECTION/Jack Stone

New Users Lack Realistic Systems View

During the first meeting of an end-user training program I recently conducted, one of the attendees approached me at the morning break with this inquiry: "I have a 3 by 5 card index to a collection of books. Each card contains the title, author, subject and other reference information. The cards are sequenced by title. Is it

possible to put the index cards onto a computer so that we can reorder the cards by subject or by author? I mean, do you think it's feasible in the coming decade?"

I was struck by the request because, somehow, I naively thought that by this time the whole world was into sorts. Because I use a multiterminal,

on-line, generalized file management system in the classroom, I was able to respond in a dramatic way. I thrust my chin forward, looked her straight in the eyes, gritted my teeth and stated in bold terms, "Not only is it feasible in the coming decade, but at 2:30 this afternoon we will begin to design your very own auto-

mated index system and by 4 p.m. we will be operating it!"

She was flabbergasted. "That's impossible!"

I promised her we would accomplish "the impossible," which, of course, we did.

This experience and many others lately have given me the opportunity to update my conclusions about the commu-

nity of new users and the abilities of computer centers to successfully cut these users over to information systems. I am using this and next week's article to share these conclusions with you, noting that my remarks are, of necessity, general and may not apply in specific cases.

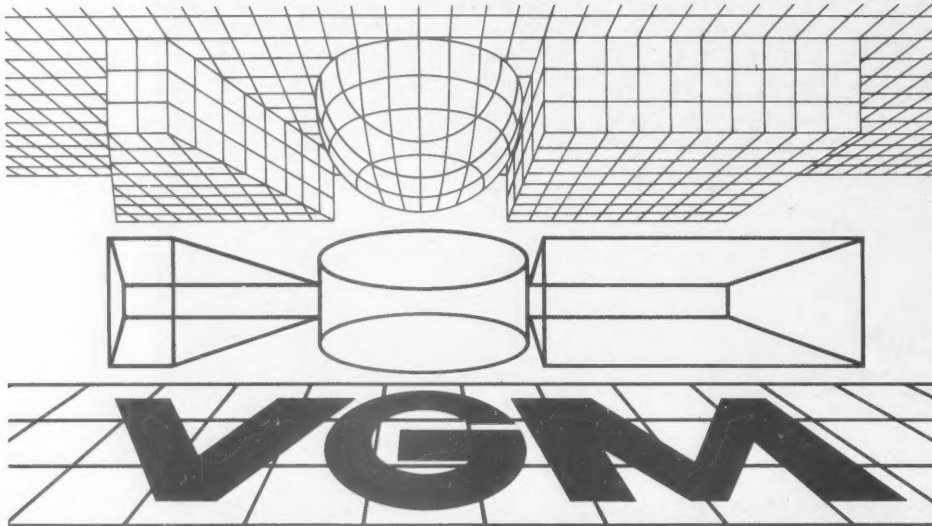
Depends on Receptivity

Of course, in bringing new users onto a complex information system, the effectiveness of the cutover depends primarily on the quality of the user/system interface, the implementation plan and other technical factors. But it obviously also depends on the receptivity — and all therein implied — of the users toward automation.

Many DPer's try to attack the receptivity problem with a charge of technical training, figuring that a little knowledge would go a long way in smoothing the transition into the joyful world of computers. But, in cases where new users have strongly negative attitudes toward computerization through hostility or ignorance or fear or just plain boredom (and I firmly believe they are the vast majority) the training doesn't always work, and the system may ultimately fail or otherwise become ineffective.

New users still suffer from the System Simplification Syndrome. Right after a particularly relevant systems demo, users will excitedly begin to identify their own areas where automation would provide substantial payoffs. They tend to forget some fundamental realities about the information systems business, including such items as these:

- User managers must be in complete agreement as to the specifics of the data to be collected and the various forms of the output.
- Proper application development requires careful analysis to validate that the installed hardware has the capacity and speed to process data files within required time intervals and generate results in required forms.
- Clerical personnel must be made available to collect and validate source documents and transfer the information accurately from these documents into the computer system.
- End users must be trained in the interpretation of the outputs.
- The successful installation of a major application depends strongly upon commitments from user management to release operating personnel for detailed planning and to allocate resources to carry out systems implementation.



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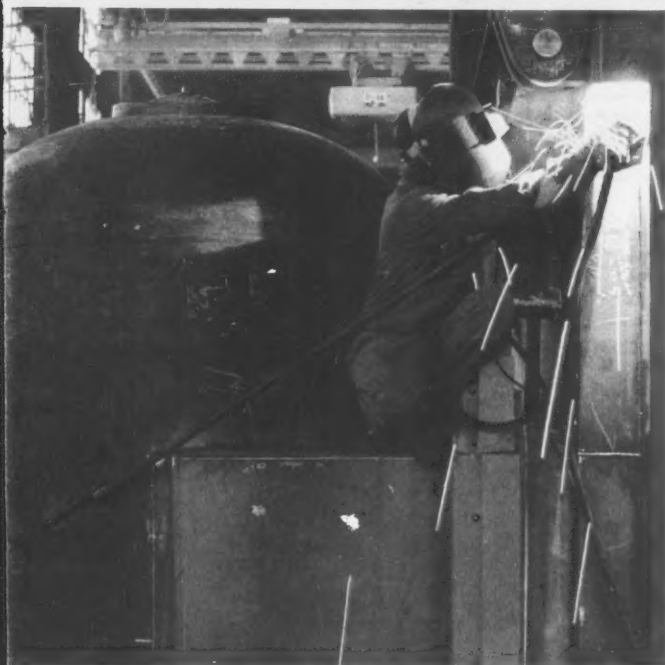


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Valuable energy can be salvaged from the exhaust of gas turbines, industrial furnaces and other heat sources. At Henry Vogt Machine Co., engineers custom-design heat recovery equipment for each customer's specific needs, with the aid of interactive computing under IBM's Conversational Monitoring System (CMS).

The heat exchangers convert heat that would otherwise be wasted into usable hot water and steam. "The computer tells us the amount of heating surface and the number of tubes to use after the configuration of the external fins has been selected," says Robert Precious, general manager of the Heat Transfer Division of the company, headquartered in Louisville, Kentucky.

"Each exhaust heat source has its own characteristics—temperature, mass flow, and allowable back pressure," he points out. "And each customer selects his own desired steam flow, pressure and temperature. He may want to use the recovered energy to generate electricity, heat a chemical process, drive a steam turbine for rotary power, or warm a building."

Each specification is unique. The design engineer must find an optimum balance of heating surface in a superheater, boiler, and economizer section for each of as many as three pressure levels. He can do this by

entering the variables through a terminal online to an IBM System/370 Model 138. The system responds by promptly displaying this optimum design.

"It used to take a week to design a unit," Precious notes. "With the computer, our engineers get a detailed configuration and cost estimate in minutes."

In the early stages of heat recovery program analysis, many variables must be considered. The interactive computer can help to evaluate each of these quickly and accurately, and to select the most efficient arrangement of heating surface at the most economical price.

The computer program can calculate the performance of the heat recovery steam generator at less than full-load operating conditions. This is an important aid to the customer who must estimate steam production over the entire operating range of a gas turbine.

"Before we had the interactive system," Precious says, "we did well to provide one calculation at the design point. The customer wouldn't know what the performance would be at other operating levels. Now that we can analyze the whole range of heat rates accurately, we are in a much better position to receive an order based on this performance feature."

At Biomation, An Assembly Line With a Steady Pulse

Today, assembly lines at the Biomation Division of Gould Incorporated almost always flow smoothly, with never a threatened stop to production because of missing parts.

"We used to operate with 130 days of inventory on hand," says Robert Nazareus, vice president, finance. "We've cut that down to between 85 and 95 days. And on expensive parts, we time our orders so the items arrive just when we need them. We use less space for storage, and we don't buy and hold them before they are needed."

"At the same time, we've cut work-in-process time in half: from 24 weeks to 12 or 13 weeks."

Biomation's line of high-performance waveform recorders and logic analyzers is a materials-intensive business, Nazareus points out. About 70 percent of the cost of a completed instrument is in the parts. To minimize the costs of lost production and out-of-balance inventory, the Santa Clara, California, division installed IBM's Communications Oriented Production Information and Control System (COPICS) in a 4331 Processor.

"Now that we can plan manufacturing," Nazareus notes, "we can enter into long-term contracts with component manufacturers. Before we had COPICS, 50 percent of our purchase orders were for delivery in one or two days—which meant that we were buying from distributors, at 20 to 40 percent more than we would have paid the manufacturers."

COPICS is a complete online system for control of manufacturing, with modules for material requirements planning, inventory accounting, shop floor routing control and other specific tasks. At Biomation, the first module of COPICS to be installed was the bill of materials processor.

There are 2,000 parts in a typical Biomation product, and frequent engineering

changes to most models," Nazareus explains. "So our bills of materials often contained errors. Since purchasing is done from the b/m's, this meant shortages of needed parts and purchases of unneeded ones. And expensive, high-level people spent time running around looking for materials."

"With COPICS, we achieved a 100-percent-accurate manufacturing document,

and then a time-phased bill of materials to take account of engineering changes. With that and a valid master schedule, we were able to begin material requirements planning (MRP) using COPICS, letting us schedule shipments from our vendors to coincide with need."

"This mode of operation is profitable," he notes. "Putting out fires was not."



Demonstration of a Biomation logic analyzer. IBM's COPICS system helps the Gould Incorporated division assemble electronic instruments such as this one at much lower cost.

DP Dialogue is designed to provide you with useful information about data processing applications, concepts and techniques. For more information about IBM products or services, contact your local IBM branch office, or write Editor, DP Dialogue, IBM Data Processing Division, White Plains, N. Y. 10604.

IBM
DATA PROCESSING DIVISION

Not Medically Oriented

In reference to the announcement "DEC Brings Out DSM-11 Update" [CW, March 9], the Mumps language is not and never has been "medically oriented."

It is a very powerful language designed for data management and handling large, on-line data bases. Mumps was developed at Massachusetts General Hospital and has a medical-sounding name, but that is the extent of its medical orientation.

As one of the growing number of commercial/financial users who looked beyond the name, I winced when I read that Mumps is "medically oriented." It is an Ansi standard language, X11.1-1977, that was designed to handle textual and financial data in an on-line, data base-oriented environment. We have used Mumps for four years and have found it to be eminently suitable for our entire credit union system.

James M. Pearson

Ridgecrest, Calif.

Reflections on 5110

A recent seminar I attended compared the Radio Shack TRS-80, the Apple and the IBM 5110. It was quite obvious the sponsors were anti-IBM. The reasons given for not buying the 5110 were, after two days of the seminar, about what I would have expected from them.

Reason 1: Multiple executable statements can not reside on one line. How ludicrous! Any knowledgeable programmer knows that a multiple-statement line causes poor readability, is a poor debugging structure and is plain poor style.

Reason 2: Not all of the standard keys are repetitive. Oh, what a pity.

Reason 3: Price. They did not want to compare it with the \$9,000, less expensive, IBM 5120.

I would like to make my own observations on the 5110. First of all, how many machines have indexed-sequential with the capabilities of multiple indexes? How many have a resident sort that can sort up to six fields in any character or numeric format including binary and packed?

Do they have an alternate sort sequence? (Example: The character "Z" given a higher sort priority than an "A".)

How about an optional sector numbering sequence when initializing a diskette? (It gives the capability of reading more than one record per diskette revolution.)

Besides all the standard basic commands, the 5110 puts many excellent matrix and other mathematical functions at the user's disposal. To top it off, it has an excellent operating system with complete procedure control.

To finalize, by the time you add a printer, diskette-type storage and all the read-only memory you need, you pay near, around or above the price of the better-built IBM.

John D. Thornby

Riverside, Calif.

CRT Noise

Regarding Stuart Dole's letter in the March 9 issue, I also have sensitive hearing. I have a TRS-80 and can tell from 15 feet away through a louvered door whether the CRT is on.

First, any stimulus that is picked up and not consciously acted upon does

produce stress, such as the flicker of a fluorescent tube going out or the whine of a CRT.

Second, Dole was very accurate in his guess, for the squeal he hears ("ringing") is very near to 15,750 Hz. Usually the circuitry dampens this noise electrically, but for those of us with sensitive hearing it does present some objectionable noise.

Third, yes there is something you can do. First, try adjusting the horizontal hold control until the sound is low, but the picture is not jumpy. If this does not remedy the situation, take the CRT to a TV serviceperson and ask him to add some sort of soundproofing material to the inside of the cabinet. If it still doesn't solve your problem, try

setting up a radio or something to deaden the sound or, should I say, cover it up.

Scott L. Statton

Anderson, Calif.

Try HP Gear

Stuart Dole brought up a point that has bothered me for some time. There are indeed answers:

1. You are not alone in being bothered by CRT noise.
2. The frequency is 15,750 Hz — far below what one would reasonably expect to use as a lower limit for any noise which can be transmitted into the work environment.
3. Don't bother isolating — just get a

Hewlett-Packard terminal. They use 22,500 Hz. We learned that when we tried to set up a direct connection to a videotape recorder (it doesn't work). They are also beautifully quiet, except for those models with fans.

HP terminals, incidentally, cause less eyestrain than those using standard video frequencies. This is because they have more screen resolution.

I suspect that HP is not alone in using a more humane frequency for horizontal sweep.

John Beckett

Collegedale, Tenn.

DPMA Curriculum

The March 9 article on the Data Processing Management Association's (DPMA) curriculum effort seemed to extoll a very curious approach to curriculum development. The use of 80 experts to expand one-page course



outlines to four pages each is the equivalent of hiring 80 interior decorators to dress up a tract home.

The experts were needed during the 12-month period when the six-man executive committee was "fixing" the seven-course core and the assorted electives and their prerequisites.

Dr. Athey's top-down curriculum design process appears to be to decide the number of courses and their titles and then allow the course descriptions to vary until the last possible moment. In the 14 months since the project began, there have been three articles in *Computerworld*, three in *Data Management* and three in *Interface*, all lauding the virtues of the curriculum without revealing as much as a catalog description of any course.

An information systems curriculum model for the education of programmer/analysts is overdue. There is considerable agreement within the profes-

sion on the topics that should be included and the skills that should be fostered.

The regional conferences conducted by DPMA have affirmed the broad agreement but have exposed only mild support for the package Dr. Athey presents.

The "experts," most of whom had not had any contact with the project prior to their nomination, have been given a blank check to reformulate the content of each course as isolated entities.

The executive committee will then attempt to smooth out the interfaces. The result is unlikely to be any better than if the 80 experts had been collected at a conference and asked to

devise the curriculum from scratch.

William Mitchell
Chairman

Department of Computing Science
University of Evansville
Evansville, Ind.

CPAs' Drawbacks

As an independent consultant with an extensive background in DP (nine years in private industry, three years in public accounting consulting and two years as an independent), I must take exception to Joseph Leubitz's suggestions to look to your favorite certified public accounting (CPA) firm for DP assistance ["Contact Your CPA," CW, March 9].

Having spent several years as a consultant with one of the largest of the "big eight" public accounting firms, I have found that many of the consultants with the public accounting firms are very good at being experienced generalists, but extremely inept at the grassroots working level of analysis, design and programming of computer systems. I have yet to see any of their systems which were not too expensive, too controlled and overestimated as to growth potential.

While I do not exclude the entire public accounting profession from providing consulting expertise to the computer user, I do suggest that very careful consideration be given by the client before engaging a CPA professional over an independent consultant merely on the basis that the CPA knows that client's business better than an independent would. No independent professional consultant will accept an engagement he is not qualified to perform; however, I have seen just such engagements accepted by CPA firms.

In addition to the question regarding the competence and experience level of the CPA professional, there is the ongoing question of objectivity and independence where the CPA firm has designed, programmed and installed the computer system. The Association of Data Processing Service Organizations (Adapso) is currently taking a very strong stand regarding this issue and I believe that its stand is well taken.

Independence can no more be maintained by the CPA firm that programmed a system than it can be maintained by an independent consultant who sells canned software.

Although I am a member of the Independent Computer Consultants' Association (ICCA), I do not know Steven Epner personally [author of "So You Need a Consultant," CW, Feb. 9]. I do, however, believe that Epner is attempting to promote the professional level of independent consultants and to raise the level of acceptance of the "independent" by DP users.

Jerry M. Cooper

Pinson, Ala.

False Picture

Regarding "IDC Finds Less Than Half of Organizations Surveyed Use DBMS" [CW, March 2], I do not take issue with the information contained within the article. However, the pie graphic used to illustrate this information conveyed erroneous information. Although the percentages were printed along with the graph, the visual picture was distorted. The graphs that appear in the article are "worthless."

For example, in the first illustration, "DBMS in Use at Respondents' Organizations": Others/unknown with 19.2% occupies 50% of the graph while "none mentioned" with 51% occupies less than 25% of the graph. In the next graph, "Programming Languages Used in Respondents' Organizations": Pascal, which represents 1.2%, occupies more space than RPG with 14.8% and Fortran with 8.9%, combined.

These examples and charts give a false picture and are totally erroneous. Before you can expect any of us to accept and put any faith in computer graphics, you have a lot of work to do. Those graphic pie charts failed the most elementary test, that of reasonableness.

Hans Von Braun

La Mirada, Calif.

LETTERS

UP YOURS.

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UP is United Peripherals. And United Peripherals is a company that specializes in putting together the industry's finest disk subsystems with some of the industry's finest minicomputers. If you're an HP 3000 user looking to up your capacity in less space, to up your cost efficiency with fewer hassles and to up your uptime with fewer spindles, UP is your next logical step.

HP MAKES TERRIFIC COMPUTERS, BUT...

Let's face it, their disk drives have not been trendsetters. Just look at the record. In 1974, when HP was introducing its 3000 computer, a firm named IBM was announcing a drive technology they called Winchester. To this day, that technology has stood as the standard in drive design, performance and reliability. And to this day, HP has yet to offer to its 3000 users a Winchester drive. And since they introduce new drives about every two years, it is not for lack of opportunities.

A PREMATURE ANNOUNCEMENT OF HP'S LATEST DINOSAUR.

Recently, HP has been telling its 3000 users to hang on, to wait just a little longer for its new 400-mb drive. Rumored for introduction this year, when it does arrive, this one won't feature Winchester technology either. Well, maybe next time. And if you are wondering what HP intends to do with the drives the new one obsoletes, you're not alone. Or maybe you are.

MOVE UP. A SMART MOVE FOR NOW. AND FOR THE FUTURE.

Put aside HP's underwhelming strides in disk drive technology, their less-than-spectacular history of drive model longevity, the question marks of when their new 400-mb model will be here and what will happen to the once-again obsoleted ones that the new model is meant

to replace. Consider instead the UPI696 disk drive subsystem. Defined by CDC's 600-mb Model 9775 with state-of-the-art Winchester design, and Microcomputer System's i696 controller, the UPI696 is a better product in every way. Compared with what HP says is coming, the i696 delivers more capacity and is based on a superior technology. Compared with HP's current 7925, the UPI696 delivers four times the capacity—and more uptime—in the same space, with dollars-per-megabyte savings of up to 40% and floor space savings of up to 75%.

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Here's the deal. We'll put a UPI696 subsystem on your floor and buy back up to three of the four 7925s it effectively replaces. And for each UPI696 add-on purchased, we'll buy back two more 7925s. Such generosity has its limits, so order soon. Besides, the sooner you see the UPI696 in action, the sooner you'll appreciate its performance. And, as far as Uncle Sam is concerned, the sooner you'll start depreciating it as well.

CALL UP.

So, if you own an HP 3000 or are contemplating one, we'd like to give you more information on how and why to UP yours.



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Sights Need Readjustment

I would like to gently chide Donald Nelson, as quoted in "Codasyl Head Hits Critics of Cobol-80" [CW, Feb. 16]. There was, in my judgment, much truth in the substance of his criticisms; it seems, however, that he mistook his target.

The burden of Nelson's remarks (as interpreted by *Computerworld*) was that the myopic preference of American business for short-term (and presumably shaky) profits, as opposed to long-term (and presumably more solidly founded) profits, inhibits investment in productivity improvements such as the new standard Cobol.

A preference for short-term profits certainly is a large factor, as Nelson correctly stated, but I find no reason for supposing that American businessfolk are more grasping, venal or greedy than their foreign counterparts

or, for that matter, than the general run of humanity. The blame, in my opinion, lies more with the political and economic environment generally, and over which businesspeople have no more control than anyone else.

As the U.S. approaches "banana republic" status with inconstant public policy and an inflationary economy, it should be no surprise to find people acting as if planning for the day after tomorrow makes no sense; it doesn't. A capricious legal and regulatory environment renders much business planning nugatory.

We had, at one time, the rule of law, and rational planning was possible. Now we are blessed by the courts and regulatory apparatus with the law of

rules — arbitrary, ad hoc and capricious ones at that.

This is not a new or original observation: "The want of confidence in the public councils damps every useful undertaking. . . . [W]hat prudent merchant will hazard his fortunes in any new branch of commerce when he knows not but his plans may be rendered unlawful before they can be executed? . . . [I]n a word, no great improvement or laudable enterprise can go forward which requires the auspices of a steady system of national policy." So wrote James Madison in "Federalist" No. 62.

The effects of an inflationary climate are at least equally foreshortening to capital investment. This is not difficult

to perceive if one abandons the absurd notion that interest is the price of money.

A more nearly correct concept is that interest is the premium that must be paid to induce forbearance in the consumption of present goods in favor of future goods. When that premium rises, it indicates a general preference for present consumption; that is, a decrease in productivity-improving capital investment. This is precisely a symptom of an advanced inflationary climate.

Business did not engender this state of affairs any more than anyone else; to ask business alone to fly in its face is to require sacrifice, charity or irrational behavior.

In sum, Nelson loaded his cannon with the right ammunition, but I believe he fired in the wrong direction.

William H. Gray

Idaho Falls, Idaho

LETTERS

NO MEMORY PARITY? Good luck!



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memory parity watchdog immediately identifies the malfunction without losing data integrity.

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On Menacing Micros

I feel that Rex Malik somehow missed the boat in his assessment of the potential menace of the microcomputer [CW, Feb. 27] as stated by David Stevens in "The Menace of Micros" [CW, Nov. 3].

Television receivers and automobiles, often used as examples of machines similar to the computer and which have significantly altered our lifestyles, are inappropriate choices. The assumption many people make (including some computer professionals) in their choice of analogies to the computer as a product of our technology is erroneous, because there is no analogue to the computer!

The pattern of distribution of computers to individuals in homes and schools may parallel that of the television receiver, but the potential effect is magnitudes greater, by virtue of the computer's capability to mimic human intelligence.

Automobiles and television receivers are designed, however sophisticated, with certain, straightforward, single tasks or related groups of tasks in mind and are within the comprehension of most people. The design of a computer is also comprehensible to most people, once they have been exposed to its working principles, but where most of us fall down is in the understanding of its breadth of application potential!

Whereas the automobile and the television receiver have had far-reaching effects on our society, the computer is not a special-purpose "machine" in the same sense that they are. No other machine can accomplish what I consider to be the computer's most important future task. This task will involve the computer's ability, through its programming, to simulate any real or imaginary entity we wish.

The computer's potential for becoming the key element in a revolution in communication, education, recreation and industry is so vast that it is almost incomprehensible.

Whether or not individuals choose the computer as a "companion" to "avoid the pain of face-to-face contact with another human being," as Stevens predicted (and which Malik pooh-poohed), or for pure entertainment or recreation, the microcomputer challenges society with a much more serious problem than Malik would have us believe.

R.K. Wiersba

Waltham, Mass.

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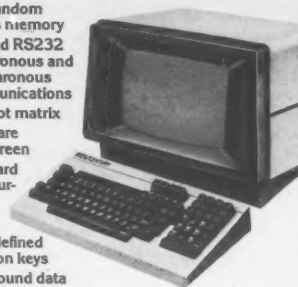
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Countries Seeking Restrictions on Data Flow

(Continued from Page 53)

is also limiting access to domestic data bases. And while it encourages the free flow of information from other nations, the Third World tightly controls the flow of information within its own borders.

The chairman of a French Government Interdepartmental Working Party, Alain J. Madec, has expanded on the economic significance of information as it is embodied in a new world economic order. In a recent article entitled "Economic and Legal Aspects of Transborder Data Flows," Madec noted "a country from which data [is] exported without being invoiced receives no reimbursement for its collection and processing costs, even though the use of this basic data will create

'In this case, developed and developing countries are gathering to quantify data flows. It may not be long before a new, restrictive body of international TDF law is in place. And it could be developed outside of forums more receptive to the U.S. such as the Council of Europe and the Organization for Economic Cooperation and Development.'

employment abroad."

He compared this situation with "capitalistic exploitation" of producers of raw materials, energy and minerals. The exploitation of information resources raises concerns about "neo-imperialism," Madec wrote, sup-

porting the developing nations' view.

He predicted that each nation-state "may one day find its territory used merely for fragments of activities planned on a supernational scale . . . Transborder flows, even more than trade in products, mean the decay of

the Nation-State."

Thus, the French and Third World share concerns about preserving national sovereignty and use these concerns to justify restricting transborder data flows.

Venezuelan Resolution

Venezuela's U.N. Draft Resolution is being referred to as "Son of MacBride" because of its emphasis on equal access to technical facilities. The resolution invites "governments as well as nongovernmental organizations and other entities in member states to extend financial as well as technical support for development of communications in developing countries . . ."

With the MacBride Commission Report and the Venezuelan U.N. Draft Resolution, the United Nations is being used to promote the new world economic order — encouraging cooperation between developed and developing countries.

This trend has alarmed the International Telecommunications Union (ITU), which is urging Unesco (for one) to work within the ITU.

IBI Working Parties

Further United Nations action is imminent. The Intergovernmental Bureau for Informatics (IBI), founded under United Nations auspices, is convening three working parties on transborder data flows (TDF), following last year's World Conference on TDF Policies.

At a meeting in Rome May 25-26, one of the working parties is scheduled to "prepare definitions of the scope of TDF [as well as] prepare topologies of data means to value and measure data products, . . . internal company data flows and traditional trade practices — in view of this new invisible trading sector."

In this case, developed and developing countries are gathering to quantify data flows. It may not be long before a new, restrictive body of international TDF law is in place. And it could be developed outside of forums more receptive to the U.S. such as the Council of Europe and the Organization for Economic Cooperation and Development.

McCarter is a Washington, D.C.-based independent writer and editor with more than 10 years' involvement in computer and communications issues. He attended last year's IBI World Conference on TDF.

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READER COMMENTARY/Howard A. Karten

Electronic Mail: A Musing

WASHINGTON, D.C., April 1, 1999 — Court material revealed here today in the long-running "Email" trial shows just how close the U.S. telecommunications system came to a total collapse nearly 20 years ago.

The material — specially reconstructed, old-style magnetic tape — shows the full extent of the economic and technological moves by Universal Telegraph & Telephone (UT&T) and Multinational Computing Machinery (MCM) as they battled for economic dominance in the then-emerging Email service.

After conspiring to decimate the already-dying Postal Service, the material indicates, the two firms lashed out at each other, employing a variety of technological and economic sabotage which included radio jamming, pirating of key employees and inundating each other with worthless information.

Surprise Move

U.S. Attorney Joe McGill, 75 and a veteran of the 19-year-long trial, introduced the material in a surprise move. Attorneys for both UT&T and MCM immediately raised objections to that material, claiming that the reconstruction of the tapes was "totally unscientific, biased and irrelevant to the case."

In 1981, public outcries over the alleged incompetence of the U.S. Postal Service seemed to have reached a peak and then subsided. For those readers not old enough to remember this period, individuals and organizations still communicated using marks scratched on a substance called "paper." Paper was a kind of flimsy, primitive version of digitizers. To communicate the papers between two parties, gaily colored but essentially worthless tokens called "stamps" were attached to the paper. These tokens were believed to constitute unwritten contracts between users and the Postal Service to deliver the paper promptly and correctly.

Late in 1981, MCM, in stormy congressional hearings, provided conclusive proof that the Postal Service had reached a new low in efficiency of only 2.1%. Along with other testimony showing that the Postal Service had dug in its heels in an attempt to delay the start of the now-widespread Email service, the MCM hearings served to scuttle the Postal Service.

The reconstructed tapes show that UT&T made a strategic move to become the parent organization for nearly 1,000 independent communication services offering cellular radio-telephone service. The cellular radio-telephone service, the forerunner of modern-day communications, allowed every subscriber to carry a telephone with him and thus receive calls no matter where he was. UT&T, realizing the power of the service, provided an intercellular link and began absorbing the independents.

At the same time, MCM, seeing an opportunity to extend its own market share (then amounting to some 65%), began promoting its own communications methodology, called Snafu-Proof Communications, or SNA for short.

The reconstructed tapes indicate, for the first time, just why and how the

Postal Service collapsed. First, the two companies hired all available telecommunications and marketing personnel, leaving the Postal Service with only limited resources with which to implement its primitive version of Email. In many cases, these people who still worked on Email were the same ones who had spent 1,000 man-years attempting to implement a so-called "nine-digit Zip Code."

After thus depleting the talent market, UT&T and MCM both resorted to computer warfare. Using their latest computers, the so-called "Z series" made by MCM, both firms flooded the country with paper mail. The Postal Service attempted to cope with this volume with its own computers, which were called "360s" and were, in effect, the Model T of the computer industry.

The Postal Service was seriously crippled when postal workers walked out, claiming it was a violation of their contract to require delivery that was both accurate and timely.

At the time, authorities were unable to account for the sudden surge in mail. The tapes revealed today show that both UT&T and MCM relied on advanced graphics printers to make each letter appear hand-addressed.

When the Postal Service collapsed, leaving only National Express to deliver bulky objects, MCM and UT&T turned their guns on each other. This resulted in five years of sporadic fight-

ing. During that period, both firms engaged in a variety of tactics, now outlawed.

One of those tactics was the use of massive amounts of lightwaves in the gigahertz region to disrupt communications fibers.

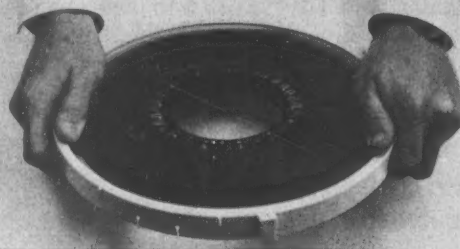
Another was called "saturation advertising." In that phase of the war, both firms engaged in massive amounts of advertising, making exceedingly more inflated claims for their service. Those abuses resulted in the Computer Advertising Act of 1983, which set up an arbitration board to certify the truthfulness of advertising claims surrounding computers.

After the five-year war, the tapes show, the two firms began secret talks aimed at peaceful coexistence. The optical disks on which those electronic price-fixing meetings were recorded were subsequently destroyed.

After the trial recessed for the day, attorneys for MCM and UT&T said they had learned of "serious deficiencies" in the tapes. The attorneys declined to say what those deficiencies were, but one source close to the defense claimed they concerned an alleged "18-1/2-packet gap" — a loss of 18.5 packets of material the defense regards as crucial.

Karten is a Boston-based free-lance writer who specializes in computing-related topics.

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Policy Management Systems

Software Is Leverage

(Continued from Page 53)

savings led to increased throughput performance of more than 35% for an annual decrease in resource consumption of \$95,000.

This illustration is the inverse of the first example with respect to software influencing hardware. Here, a little bit of software goes a long way in reducing the bill for hardware. This leads us to the fourth observation:

4) Software can substantially reduce hardware expenditures.

More Efficiency

There are, of course, a variety of commercially available software products that lead to more cost-effective use of a hardware system by:

- a) Increasing the utilization of available hardware resources.
- b) Reducing the need for memory, storage units and so on.
- c) Allowing more peripheral devices for given CPU power.
- d) Performing more efficient processing; increasing throughput.

Any one or a combination of the above can enhance performance, increase volume handled or delay acquiring additional hardware to meet current or expected loads. We therefore can also conclude:

5) Software can substantially impact the more efficient use of hardware.

Good examples of software that fulfills these promises are performance monitors and tuning systems, improved sort packages and better operating and administrative systems.

Next, we look at the inherent leveraging capability of software itself. Assume that a software product is purchased and used for a conservative five-year period. Also assume that the purchase price is followed by a 15% annual maintenance charge. The total cost of this fully maintained software in a five-year period is therefore approximately 3.33% of the purchase price per month, or \$1,000 if the base product price is \$30,000.

This equates to less than one-fourth the total cost of a good programmer. But let's see how much further this product can be exploited.

First of all, the product can be used by many programmers. Also this software can be embedded in many applications. Unlike the hardware, software is comparable to the amoeba — it can split and be replicated over and over again with performance only limited by the available machine execution states. Thus, executing the same software in different partitions of a machine, or in a number of VM systems, in effect gets the user additional benefits for no additional cost.

Software, could, under these extending circumstances, have an effective cost which approaches a small fraction of a DP professional's burdened com-

pensation.

Software is the world's greatest opportunity for cloning. Software is inherently leverageable, leading us to the sixth principle:

6) Software is easily cloned and can be amortized over a substantial population of programmers and applications.

There is a seventh observation about the leveraging capacity of software. In a recent journal article, a user cited the purchase of a general ledger software package for \$30,000. It was claimed that developing a similar system on an in-house basis would have cost this user at least \$500,000. This better than 15-to-one ratio of "make" over "buy" is impressive and so we observe:

7) Software can be manufactured and distributed as a product at substantial savings to the user.

Long Life

Which brings us to the eighth and final point on software leverageability. Software has an exceedingly long life when compared with hardware. A software investment can be amortized over a five- to 10-year period with no substantial risk — which is certainly not true with respect to hardware as seen in the last decade.

Software, as long as it is maintained and enhanced, will outlast the hardware. Indeed, this observation is confirmed by virtue of the many suppliers that have entered the market with IBM-compatible CPUs, hoping to gain

their foothold by exploiting existing IBM-oriented software.

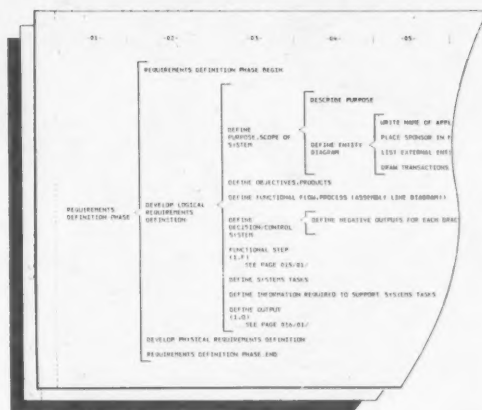
Semiconductor technology has now reached a point where it is cheaper to upgrade the existing hardware to its most cost-effective state in order to execute existing software rather than to reprogram an application to fit a new hardware logic. We conclude:

8) Software has the potential for a long life cycle, so an investment can be thoroughly exploited with a large return.

Software has been and continues to be quite a bargain and can be exploited to achieve significant economic benefit in most DP operations.

Frank is executive vice-president of Informatics, Inc., Woodland Hills, Calif.

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Productivity

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STRUCTURE(S) was developed primarily to support Warnier/Orr diagramming techniques, but it can be used to automate other types of structure charts—HIPO, Jackson, Yourdon-Constantine.

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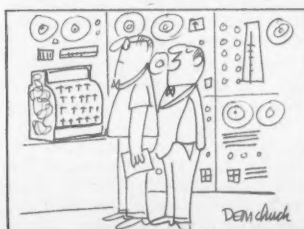
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The Student's View of On-Campus Interviews

(Continued from Page 53)

One way an employer can gain an important advantage over competing interviewers is to send information processing professionals to conduct the on-campus interviews. The rank of these professionals is not particularly important — they might be project leaders, analysts or first-line management. What is important is that they can talk authoritatively concerning what is going on in DP at the company they represent.

The students will want to know: Do you use a data base management system? Do you use IBM equipment? What operating system do you run? Do your programmers work in project teams? Clearly, only computing professionals will be able to discuss such

questions knowledgeably.

Most students consider talking to professional recruiters a waste of time, something they do only because company policy might require it. Company placement people are very good at answering questions about the company in general, such as benefits, general corporate philosophy and on, but the new grad is typically much more interested in specifics concerning the nature of the job. For example, at the very least, the student wants to know whether the job involves microcomputers or mainframes. He won't often spend time on a future on-site interview unless questions like this can be answered during the on-campus contact.

If your company insists the person-

nel office handle on-campus interviews, perhaps you can request that one computer professional be included in the interview team to answer a few of the technical questions of greatest interest to the interviewees.

If your company simply will not allow technical personnel to participate in on-campus interviews, chances are the corporation has a professionally capable group of recruiters. These people may well be familiar with such technical terms as "network," "database," "minicomputer" or whatever. But your job is to make sure that they are fully apprised of the personnel needs of your department. Talk to the placement people actually responsible for the on-campus interviews. Explain the personnel requirements of your

group to them and make sure they understand the general meanings of the technical terms likely to spark student interest in your area.

Interview Pitfalls

If your company does allow DP employees to conduct campus interviews, here are a couple of pitfalls they should avoid. It is important, for example, that they don't assume the superior role of "the experienced professional interviewing the uninitiated young student." Sure, the graduate is likely to be relatively young and probably lacking in relevant experience, but the interviewer should not act condescending in any way.

Another interview pitfall to avoid is not being straightforward with the interviewee. It may be tempting to embellish the job description a little in view of the level of competition for capable graduates. But few graduates will "buy a line," and you probably wouldn't want to employ the ones who would, anyway. Put your best corporate foot forward by fully explaining what your company has to offer. This is what attracts and motivates the good people.

Common courtesy is closely related to the above. It never hurts to put the interviewee at ease, to be friendly and pleasant even when it's quite clear the interview will go nowhere.

Nonmonetary Factors

What are students looking for in their jobs? Quite a few studies have shown that working conditions, job satisfaction and the nature of the work are most important to experienced DP professionals. It is no different for most students. If the salaries of various offers are no more than a couple of thousand dollars apart, these other factors are most important.

One important concern for many graduates is the level of responsibility they will have in their new job. Accustomed to summer employment and internships, they are hoping for a higher level of responsibility. Students who have worked particularly hard in school or who have paid for it themselves have been striving for a job that proves to them their efforts were worthwhile.

Graduating students also want to feel that if they go to a company and prove themselves over the next several years, it will lead to increasingly responsible positions. So, you might like to discuss the career paths available in your company.

Diversity is another quality many graduates look for in their first jobs. Most students are well aware that many DP employees get boxed in by their narrow technical specialties. If your company can offer a good combination of programmer and analyst duties, rather than more narrowly defined responsibilities, be sure to discuss this thoroughly.

Finally, I should mention the obvious: The job objectives will be as numerous and as varied as the people you interview. There will be potential employees interested in most any job. The problem is one of establishing contact with those persons who will be interested in the positions you offer and approaching them effectively.

Fosdick is an independent consultant and author based in Chicago.

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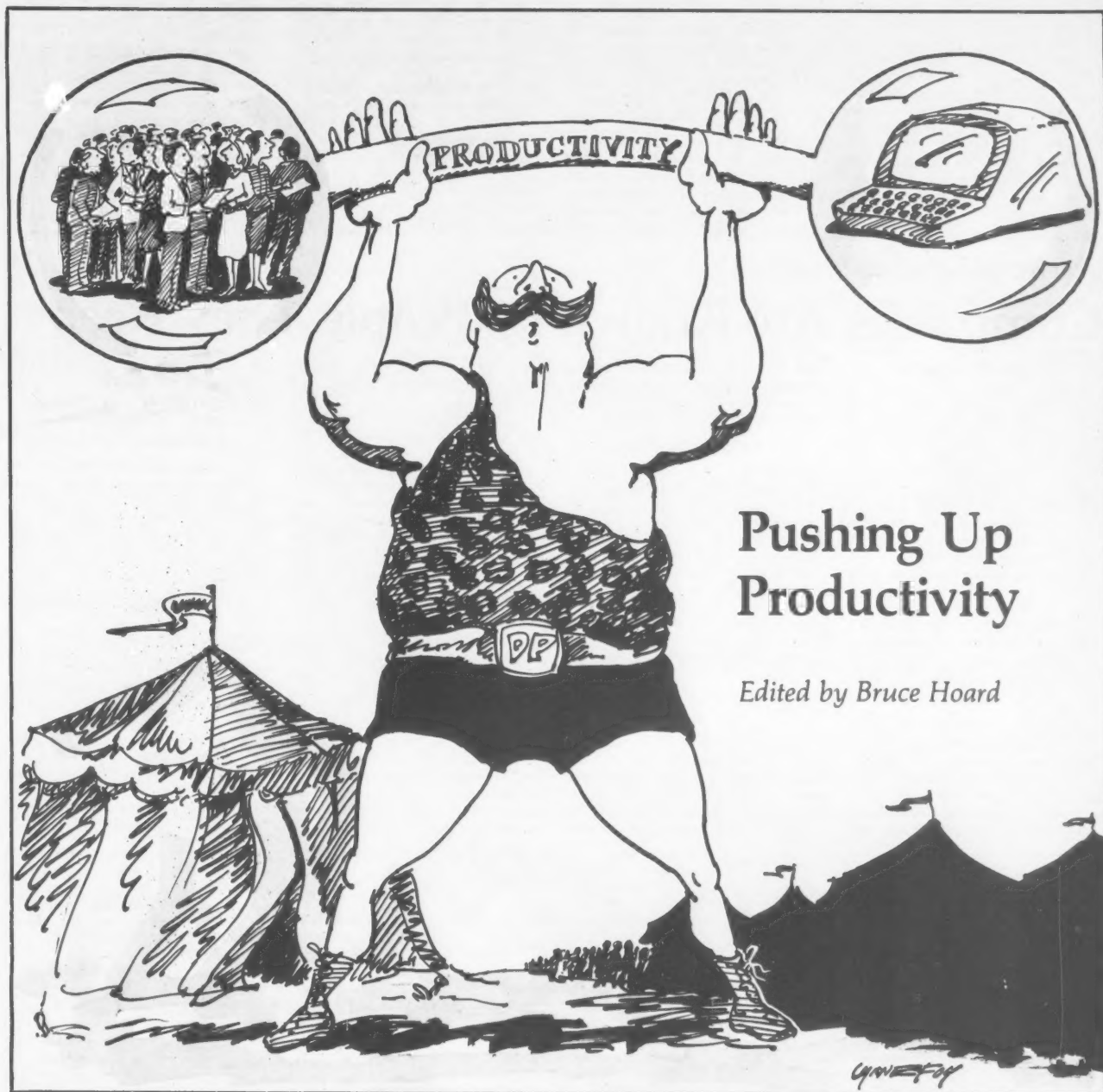
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March 30, 1981

SPECIAL REPORT



Pushing Up Productivity

Edited by Bruce Hoard

 **COMPUTERWORLD**
THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY

Readers Air Confusion Over Productivity

"I fear, as we try to become more productive, that we will strike out in more than a dozen different directions." — CW reader

By Bruce Hoard
CW Staff

To say the least. Judging from the innumerable definitions and permutations of productivity suggested by readers on this most elusive of subjects, the only thing definite about it is the confusion over its identity.

"It would be a tremendous public service if someone, perhaps this special report by Computerworld, can really come to grips with this issue and offer some clear insights and directions." — CW reader

Exactly the idea. After being deluged with articles and ideas, we have tried to assemble a selection of the most useful and enlightening pieces. Regrettably, the sheer volume of reader responses made it impossible to use everything.

"The real difficulty is that hardly anyone is willing to face up to, and put into words, the fundamental truth that what must be improved is 'people productivity.'"

— CW reader

Right on, reader. Productivity is a function of people, even if it comes from a machine. And we've got lots of good people-improving ideas.

"The use of generators promises

to dramatically improve software development productivity."

— CW reader

Hardware and software productivity aids are also important. Program generators may provide programming language capabilities to develop those parts of the application which are not common or amenable to a more packaged approach.

"Then too, productivity always seems to be applied to the production side and never to the management side."

— CW reader

Not in this Special Report. Management is shouldering more and more responsibility for decreased productivity and the following articles reflect that.

"It is not uncommon for it to take several months before a new hire becomes productive."

— CW reader

That's a long time, but it needn't be. Programmers are frequently portrayed as complex and cranky individuals who are difficult to work with.

"We must know how to be productive before we can achieve increased productivity."

— CW reader

Ah, the beauty of simplicity. Hopefully, this Special Report will make it easier for you to reach "the quality or state of being productive" as defined by that old word-smith, Noah Webster.

Turnover or Survival

Companies Are Known by People They Keep

By Stewart L. Stokes Jr.

Special to CW

Cut turnover by 25% and you'll increase productivity far more than all the structured analysis, design and programming techniques ever will! Whether you agree with this statement or not, you have to agree that excessive turnover is one of the leading contributions to decreased productivity in those areas of the country with heavy concentration of computers.

I'm not suggesting you stop using improved productivity techniques. I am saying that more time and money needs to be invested in the training and retaining of our most important asset: people. If you expect to cure your productivity woes through techniques alone, you're addressing only a part of the problem.

In its "Forecast '81" issue, *Computerworld* featured a cartoon on its editorial page that summed up the DP productivity plight. It pictures a DP manager caught in an hour glass, being squeezed between "low experience, high salaries, low job satisfaction and

high turnover." The combined effect of these forces impacting the DP environment contributes to the productivity squeeze in data processing.

Easing the Shortage

How do we:

- Increase experience levels?
- Ease salary increases?
- Increase job satisfaction?
- Cut turnover?
- Improve productivity?

There are no short-term solutions. What is needed is a comprehensive professional development program that includes recruitment, job definitions, career progression, salary administration, job assignments, training and education and performance review. This is an expensive proposition, but the return on investment may boil down to survival.

I don't have to detail the problems of turnover, job vacancy rates, technological change, lack of qualified managers or lack of people entering our industry. These all lead to one result: the demand for new applicants has out-

paced our ability to produce. We will continue to fall further behind in the 1980s.

It is expected that total spending on data processing will double by 1984, up from \$50 billion to \$100 billion. Currently, we have a job vacancy rate of 17% in those jobs classified as related to systems development — analysts, designers and programmers. In one category alone, data communications specialists, there is a vacancy rate of 27%.

Where have all the people gone? They have gone into other industries and professions because we have not spent the time or the dollars to encourage professional development. People — our most important resource — are being left behind in the race for more sophisticated techniques, hardware and software.

While there are no easy answers to this dilemma, management is listening. The challenge is to build a professional development program that does make an impact on productivity and does provide challenge, recognition, re-

sponsibility and growth opportunity. These alone will substantially increase job satisfaction and motivation with a resulting decrease in turnover.

Professional Development

A professional development program must be: goal-oriented; linked to realistic and achievable career growth opportunities; integrated with the way the DP department develops and maintains systems and organized as a "business within a business," tied to the business plan, corporate goals and operating objectives of the organization.

Some achievable goals include:

- Providing a means of bringing new entry-level and experienced people into the organization to provide the mix necessary for organizational and personal growth.
- Providing training and education on a planned basis in order that employees will continue to grow professionally.
- Ensuring that employees are aware

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The 80-20 Rule Programmer Development Ensures Good ROI

By Brian S. Callahan
Special to CW

AUGUSTA, Maine — We expect a person hired by Central Maine Power Co. here, with no DP background whatsoever, to be programming regular work assignments within three weeks. If a person is not doing regular programming tasks — not "make-work" tasks, but genuine tasks with completion deadlines — within five weeks, then we consider termination.

This is how we do it. When we started to design our entry-level training program, we asked ourselves: "What is the objective of the DP department?" Our answer was, "To provide solutions to business problems." That was our product. The answer seems rather simple, but I think a lot of DP shops only pay lip service to the idea that we are really a service organization for the rest of the company.

The rude awakening comes when we really realize our DP department will fail if we are unable to recognize, analyze and solve business problems; and the skills needed to recognize, analyze and solve business problems are totally unrelated to DP.

Business Solutions

Programming is nothing more than the execution of a business solution. Yet this least necessary skill is often given top billing in most departments. The vast majority of our programming staff's time (80%) should be spent on skills directly related to solving business problems. These include interviewing clients and client managers, problem determination, alternative proposals and designs and proposal preparation and decisions.

Only 20% staff time should be spent on programming because, as I have stated before, programming is nothing more than the execution of a business solution.

Yet, look at how we tend to spend our training budget. If we are doing well, we are spending 20% of our budget on training people how to solve business problems and 80% on how to execute the solutions. We are spending our training budget, both time and money, in opposite proportions to the necessary job skill requirements.

ROI Technique

We must switch the emphasis of our training programs to meet the job skill requirements for the 1980s. Probably the best way to do this is to reexamine our training program using the return on investment (ROI) technique.

If we design our training program so that it provides a good return on investment, then our education budget will get approved. The best curriculum in the world is worth absolutely nothing unless you can get the money to teach it.

How does our ROI look? It probably looks like this. Let's assume the cost, including overheads, for an entry-level programmer, is \$20,000 a year. Let's assume a one-on-one instructor teaching method, with a cost for the instructor of \$30,000. Let's also assume that once our entry-level programmer is trained, that he will create \$10,000 of

useful work in the first 12 months of doing actual work assignments.

We can see, from Figure 1, that if our entry-level training program takes six months to complete, then our company would spend \$25,000 before we ever started getting any return on our investment. If our training program took only three weeks, then we would start getting some return on our investment before the first month of employment was up.

Looking at the net cost to our company, a training program takes six months to complete and will cost more money in two months than a three-week training program would cost in six months.

Figure 1 also gives us a look at the actual ROI of our hypothetical case. A six-month program will give us an ROI of 0%, while a three-week training program will give us an ROI of 37%. Which one would you choose?

If you used multiple students per instructor and used audio-visual tapes to replace some of your "stand-alone" instruction time, the results are still the same. All you are doing is reducing the total amount spent. You're not adding anything to the value received, and your ROI is still zero.

Bare Essentials

We began building our program by examining what we felt were the absolute bare essentials that an entry-level person needed in order to code, test, and install a simple program. We found three things were necessary:

- A language to transmit instructions to the computer.
- A procedure for telling the computer what to do.
- A medium for creating and storing language statements and procedure instructions.

These three areas are basically

COST COMPARISON		
MONTH	OLD WAY	NEW WAY
1	\$4,167	\$3,542
2	\$8,334	\$5,209
3	\$12,501	\$6,876
4	\$16,668	\$8,543
5	\$20,835	\$10,210
6	\$25,002	\$11,877
TOTAL SPENT	\$25,002	\$11,877
VALUE RECVD.	-0-	\$4,373
R.O.I.	-0-	37%

Figure 1

The media selection and time frame for each instructional section is as follows:

Cobol	— Film strip	24 hrs.
Shrunken Cobol	— Tutor	8 hrs.
Structured Coding	— A-V	12 hrs.
Top-down design	— A-V	12 hrs.
JCL	— Tutor	8 hrs.
Time-sharing	— Tutor/S.S.	8 hrs.
Utilities	— A-V (Honeywell)	4 hrs.
Sorts	— Tutor/S.S.	4 hrs.
Standards	— Tutor/S.S.	4 hrs.
Review/questions	— Tutor	12 hrs.
		96 hrs.

96 hrs. = 6.4 hrs. per day for three work weeks.

Figure 2

handled by Cobol, JCL and time-sharing.

We then examined each area, and did a functional decomposition to find out what was really needed, what could be added later and what is specialized ma-

terial. The functional decomposition sounds easy; but in actual practice, people have a tendency to regard every topic as essential.

You must keep the 80-20 rule of pro-
(Continued on SR/4)

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Companies Are Known by People They Keep

(Continued from SR/2)

of management's expectations on an individual as well as departmental basis.

- Providing the opportunity to work on challenging jobs and letting people know the results of their efforts.

- Communicating about advancement opportunities in the organization.

- Building an "esprit de corps" in the organization; in other words, giving employees a reason to stay. One key way to do this is to be sure that professional development is not isolated from the mainstream of DP activity.

Second, a DP professional development program, coupled with a career path program, must be linked to realistic and achievable career growth opportunities. Participants must see a payoff to their education and development activities, not only in terms of increasing today's job skills but also tomorrow's advancement opportunities.

Fear of Obsolescence

A significant concern of DP professionals is the fear of becoming technically obsolete. In today's world of constant change and growth, lack of continuing DP education will spell personal obsolescence in only a few years. When DP pros sense they are in danger of becoming technically (and managerially) out of date, job satisfaction and self-motivation are eroded.

Productivity drops and people begin to spend more time looking around for (what they think are) greener pastures than they do fulfilling their current responsibilities. The sum total of those who fear becoming obsolete is a DP installation that falls further behind with every passing day. The shop, and the people who run it, are caught in a downward productivity spiral.

This productivity tailspin can be arrested and turned around when DPers are encouraged to participate in ongoing programs of education to improve and fine-tune their technical and managerial skills. This investment will really pay off when participants know why they are attending courses, what

is expected of them and how they will be using the material back on the job.

Third, professional development should be linked directly to the way the DP department develops and maintains systems. In effect, professional development becomes an integral part of the process and is no longer isolated from the mainstream of day-to-day DP activity. This is the only way in which professional development can make a meaningful impact on DP and the organization.

Professional Development

Finally, I believe that the mission and purpose of professional development can be summarized as making effective use of scarce resources (people) to achieve desired results. As such, professional development should be organized as a business within a business. Its objectives must dovetail with the objectives of the company as a whole. Professional development programs must be linked to the business plan, corporate goals and operating objectives of the organization. If they are, and if DP educators and managers work closely with functional line managers to keep them that way, then job satisfaction will increase, low experience will be offset and the quantity and quality of output (productivity) will increase.

(Continued from SR/3)

programming in mind.

I think we all remember the 80-20 rule. In DP training, 80% of all programming assignments require only 20% of the training. If you have a full-blown entry-level course of instruction, then a new programmer only needs 20% of those courses in order to do 80% of the programming assignments they will ever receive.

The whole secret to the ROI technique of training new programmers fast is to identify the essential 20%; teach it to a new person and turn him loose.

We also decided that our teaching ap-

proach would try and resemble a "cookbook" approach. We would teach one way of doing each item. If there were several ways, we would pick one and teach it, and allow the student to learn the other methods, if he wanted to, later on. The training material would be a combination reference document and handout.

Education Plan

Relevant education is important. Listed under the following eight points are some pertinent questions to consider.

1. **Corporate identity education.** What does the company do? How is it organized? Where is it going?

2. **DP identity training.** What does the department do? How is it organized? How does it function? What is expected of employees? Where is the department going?

3. **Application education.** What are the major application systems and how do they assist the operating departments?

4. **Technical education.** Depending upon the company's requirements, these include data base, telecommunications, structured design and pro-

gramming, performance measurement, operating systems and minicomputers.

5. **Systems development courses.** Workshops on systems analysis, systems design and the rigorous systems development methodology used by the company.

6. **Supervisory and management courses.** Project management, leadership, managing and motivating others.

7. **Human relations and communications skills.** Data processing professionals often have difficulty communicating well and working with others. There is a definite need to improve human relations skills as well as interpersonal communications skills.

8. **User education.** Users can contribute meaningfully to the development process with the proper education and guidance.

Our business results prove that management is paying more attention now to professional development than ever before. Professional development is a major piece of the productivity pie. All of the above elements, when applied in a consistent manner, will make a considerable dent in turnover, thus increasing people productivity.

In the end, DP professional development does not cost, it pays.

Stokes is manager of education programs for QED Information Sciences, Inc., Wellesley, Mass.

Career Development Ensures Good ROI

(Continued from SR/3)

proach would try and resemble a

"cookbook" approach. We would teach one way of doing each item. If there were several ways, we would pick one and teach it, and allow the student to learn the other methods, if he wanted to, later on. The training material would be a combination reference document and handout.

The student could make notes in the document, and use it later on as a reference document while working on his own. The instructor could also use the same material as a course outline.

In our company, this type of one-on-one training is conducted by the technical support staff members. Designing our training materials in this manner not only gave the student good working reference material, but also permitted any member of the technical staff to be the instructor.

Cobol Training

First, we give Cobol training. This training isn't anywhere as extensive as you might think, because we teach what we call shrunken Cobol. Shrunken Cobol is 12 verbs, and with these verbs you can code any application program you want to.

We honestly feel that if you have the ability to analyze and solve a business problem, then you can learn 12 commands of the Cobol language. The 12 Cobol verbs we teach are Open, Write, Close, Move, Accept, Compute, Display, Examine, Set, Perform, Read and If.

We then teach structured coding and top-down design techniques. These courses are readily available on multimedia tapes. We also teach some rudimentary coding strategy. We teach them the basic logic of an edit program

and a select/print program.

What is really most important is what we don't teach: logic of update programs, data base, on-line, operating systems/job flow and dump analysis. We don't ignore these topics — we merely postpone the training in these areas until the student has done some productive work.

JCL Lesson

The second topic, which we teach a new person, is JCL, or "How to tell the computer what to do." Here again, we teach only the JCL they need to compile and execute a program. Once they have learned productive programming skills, they can pick up the more intricate JCL commands.

We teach the JCL cards that deal with job/task identification, passwords, tapes, permanent file space, work file space, system output and card files (input and output).

We provide "modifiable" samples of complete JCL to compile a program, execute a program, sort, copy a file and print a file.

For time-sharing, we teach sign-on/log-off, source code manipulation and job submission/execution.

The basic thrust of our whole program is to teach only what is absolutely necessary, and only teach one way to do it. Remember, this is basic training; you can send them to OCS later.

Well, that's how we do it. Hopefully, I have given you some ideas that will be useful to you. May I leave you with one last question: How's your ROI?

Callahan is supervisor, technical support systems, Information Systems Department, Central Maine Power Co., Augusta, Maine.



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Too Many Specialists Complex Tools, Redundant Effort Kill Efficiency

By Don H. Lee
Special to CW

Productivity, productivity, oh where have you gone? The answer to that is somewhat akin to the question regarding the number of angels that can simultaneously occupy the head of a pin. That question has never been fully addressed, and the causes and cures with respect to productivity probably fall in the same category.

The purpose of this article is to focus on a particular aspect of the problem, namely, the software tools that are generally available to the DP community. The anatomy of business applications software is now pretty well understood, but the tools available to "institutionalize" this body of knowledge are sadly lacking. Productivity is therefore sacrificed to the insatiable appetites of ineffective, complex software development aids and unnecessary redundancy of effort.

Consider the following partial list of ingredients for a fairly typical business application development project: data base — data base administrator; operating system — systems programmers; hardware — computer operators and terminal handler — systems analysts, programmers, managers and users.

Mix these ingredients well (plus the others not included here), add several man-years plus a generous helping of funds, and out comes the finished production application — behind schedule, over budget and often unsatisfactory to the users.

Too Many Specialists

Too many specialists. Too much redundant effort. Why is this and what can be done about it?

A quick glance at the above system development recipe clearly indicates that there are an awful lot of "specialists" involved. These specialists exist in order to make use of the available software tools — data base, operating system, terminal handler and so on. The fact is that the tools are so complex that expert, specialized staff is required to make use of them, thereby contributing to the problem instead of the solution.

Then, of course, we have the applications programmer. He receives his programming specifications from the various other specialists on the project; principally the systems programmer, the data base administrator and the systems analyst. These people have all translated the necessary information into the form necessary for the applications programmer to do his job. He then codes and tests each of the required programs. Unfortunately, probably 60% of the code he writes is redundant of code that he (or his colleagues) wrote before.

This is because much of what the programmer must do involves redundant activities that do not vary from program to program and application to application. For example, the requirement for interactive on-line transactions to provide for menus, inquiries and updates to a data base is universal. Only the data names change. The situation is the same with batch reporting.

It seems clear to me that significant

advances must be made with respect to systems software and software development tools. Data bases and operating systems need not be so complex that every installation requires its own in-house staff of specialists. The industry simply cannot bear the cost of Cobol programmers writing the same lines of code over and over again.

These advances will happen only if the DP consumers demand it. It is not enough to ask the manufacturer about the cost per byte of memory or the machine cycle time. That is no longer the major issue. The important matters

now deal with the "people-costs." What software tools are available? How effective are they? If the operat-

'Too many specialists. Too much redundant effort. Why is this and what can be done about it?'

ing system requires a staff of systems programmers, the data base software requires a data base administrator, and the time required to implement new applications or modify old ones tends

to be measured in man-years, then perhaps other alternatives should be explored.

During the next several years, the winners in this high-stakes game are going to be the DP users that demand and get the necessary productivity tools and the suppliers that provide them. I know it can be done, because my company, among others, has already started the process.

We have developed and are successfully marketing a software tool for on-line processing applications. On-line

(Continued on SR/6)

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• Corporate Needs Emphasized

Management Dilemma in 1980s:

By Stephen P. Keider

Special to CW

There are 80 pyramids along the banks of the Nile River, all built between the years 2700 B.C. and 1700 B.C. The biggest of the pyramids, appropriately called "The Great Pyramid," was built by King Cheops in Giza, which is near the head of the Nile Delta on the west bank of the river.

It is 755 feet square, covering about 13 acres, and consists of 2,300,000 quarry stones, each weighing about 2.5 tons. The construction of the pyramid took approximately 20 years, with anywhere from 100,000 to 250,000 laborers employed. The cost of construction labor alone, priced out at a minimum wage of \$3.40/hour, exceeded \$35 billion (in 2700 B.C. dollars).

Furthermore, the Egyptians accomplished these massive tasks with a minimum of automation — using the lever, roller and inclined plane. Lubricants, though the pyramids rested on a virtual sea of oil, were water and milk.

To a civilization such as ours, softened by an industrial revolution and, more recently, an information revolution, the productivity of that army of people is awesome. But was it productivity that accounted for that enormous feat? Let us examine the term productivity.

Traditionally, productivity is defined by industrial engineers as:

$$\text{productivity} = \frac{\text{physical output}}{\text{total man-hours of work}}$$

Thus, through the use of rather primitive tools, the Egyptians accom-

plished a productivity ratio fractionally greater than one. Could the productivity have been substantially improved? Certainly, through the use of tools such as trucks, cranes, carbide saws and so on. However, there is another way to have improved productivity infinitely, and that is by not having built the pyramids at all, but rather to have funneled these billions of man-hours into work that had more meaning to the Egyptian economy of 2000 B.C.

This concept as it applies to information systems productivity becomes

quite clear if productivity is redefined as:

$$p = \frac{\text{net useful output}}{\text{resources employed}}$$

The term "net useful output" is composed of several factors, none of which have to do with lines of code per day or cents per transaction processed.

"Net useful output" is composed of direct corporate savings (measured in dollars) resulting from the implementation of the system; direct increased corporate revenue (measured in dollars) resulting from the implementation of the system; and increased cor-

porate productivity (measured in dollars) resulting from the implementation of the system.

"Resources employed" include equipment costs — terminal, lines, software, packages and so on; personnel costs — data processing department; and personnel costs — user department.

Furthermore, because no two companies are alike regarding industry, staffing, geography and so forth, there can be no absolute productivity measure, but rather the productivity ratio must be continually recalculated and mea-

Complex Tools Kill Efficiency

(Continued from SR/5)

transaction processing software can indeed be implemented in minutes or hours instead of days or weeks.

Optimistic Outlook

Other companies are beginning to offer competitive products both for on-line processing and batch reporting. Some hardware manufacturers provide sophisticated, flexible and relatively easy-to-use operating systems. The prognosis is optimistic, but by no means assured.

"I look forward to the day when an analyst can sit down with a user and define the major elements of the user's current requirements. Then, within a matter of a few days, a "prototype" system can be constructed for approval by the user.

This process can be iterated until both parties are satisfied that the basic requirements have been met. Then the detailed, truly application-specific logic is added to the prototype software — that is to say, those requirements that in fact require the creation of "virgin" code.

My company is going to be among the winners. Is yours?

Lee is president of Computing Capabilities, Inc. of Mountain View, Calif.



Pyramid Building or Productivity Gains?

Net Useful Output •

sured against the prior productivity number.

Quantum Leaps

Computer people, being numbers-oriented, have made quantum leaps over the years in productivity increases, although it was not a productivity issue in the '60s, but a substitution issue (that is, replace 19 payroll clerks with an IBM 1401). In the '70s, it was not a productivity issue but a systemization issue (that is, hipo, structured programming, chief programmer teams and so on).

In the '80s it is a productivity issue and that means the right person at the right time on the right job, but more importantly, doing the right thing and being measured accordingly. Productivity today is discussed in terms of lines of code per day, cost per line of code and millions of instructions per second (Mips) the new computer will execute.

It sounds like how high is our pyramid? Is it the highest? How many stones are there in our pyramid? Is our pyramid the most costly?

This is primarily due to the rapid

changes in technology over the past two decades. Unfortunately, information systems management has become more technology-oriented than results-oriented. That is, we are more concerned with how we are building, or what we are building, than why we are building a system.

We praise the system programmer who writes his own sort package, because the vendor sort is inefficient, yet we rarely concern ourselves with the real costs connected with that project (that is, machine time testing, user impact, education, conversion time, lost

opportunity, maintenance and so on).

We praise the systems team which designs the most sophisticated, complex, state-of-the-art, on-line, real-time, data base, transaction-oriented distributed processing (have I forgotten any buzzwords?) order entry system, yet we may have ignored the operational and economic feasibility of the system.

We praise the project leader who installs a new system over the objections of a recalcitrant user (because the dumb user didn't know what was needed to run the business anyway), yet we pay no heed to the disruption caused within the user department and the potential adverse bottom-line effect.

We praise the project team, which manages to build a completely customized payroll against all odds in an inordinately short period of time, yet ignore the fact that several dozen packages could have accomplished 80% of the same task for 20% of the cost.

Cost Center

We praise the manager who boasts of low turnover because he is always challenging his personnel with the newest systems, the newest equipment and the newest operating systems, yet we ignore the fact that the information systems department exists solely as a service arm (a cost center?) of the total corporate organization, which is in business to either make a profit or provide service.

An atmosphere of constant change for change's sake itself may in fact be counter-productive to the business goals of the organization.

Finally, we praise the manager who contains his budget, yet ignores the vast potential of savings which are sacrificed by parochial attitudes and lack of business acumen.

We can, over the next decade, continue to build pyramid systems that are massive edifices, brilliantly constructed and technically perfect. However, they have little earthly value, except that of serving the self-actualization needs of the personnel in information systems, as opposed to the needs of the corporation. We can continue to reinvent the wheel.

In the productivity-oriented decade of the '80s, however, the successful manager of information systems will find his loyalty shifting toward the corporation and the user departments. He will find future equipment decisions to be dictated by need, not by artificially contrived economics of scale. He will find that his role will change from that of hiring, doing and equipment evaluation to one of planning, organizing, staffing, directing, coordinating, reporting and budgeting the classical management functions.

He will find himself to be a businessperson first; requirements-driven, not technology-driven; and an employee of the company, not of the information systems department.

Throughout the '80s will it be pyramids or productivity?

Keider is vice-president of Computer Task Group, Inc. in Cleveland, Ohio.

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Four Common Complaints Tips Boost Maintenance Programmer Morale

By Nicholas Zvegintzov
Special to CW

Many management information systems (MIS) managers tell me that the programmers who maintain and upgrade existing programs are essential, but that they often exhibit morale problems. The most common complaints about maintenance programming are:

- It deals with trivial problems.
 - It's hard work.
 - It's never finished.
 - It doesn't seem to go anywhere.
- Good morale relies on having an im-

portant job to do, having the tools to do it, seeing it done and getting credit for it. So these complaints strike at the

'Remind the maintenance programmer that the health of the organization is in its response to change, just as the growth of the tree is in its outermost ring. Sure, the methods are often trivial for a computer expert . . . but that's what we're paid for, to find trivial solutions to hard problems.'

very nature of morale. Let's see how to answer them — not with insincere

promises that things will be different tomorrow, but with answers that build maintenance staff morale on today's

reality. Maintenance deals with trivial prob-

lems? Hardly! Maintenance deals with the business changes which are the life-blood of the organization. Banking regulations change to allow new business which blends savings, checking and credit card transactions — so the demand deposit accounting system must change. A new marketing subsidiary is acquired — so the sales information system must change.

Remind the maintenance programmer that the health of the organization is in its response to change, just as the growth of the tree is in its outermost ring. Sure, the methods are often trivial for a computer expert — another edit, another table, another sort, another report — but that's what professional expertise is all about. That's what we're paid for, to find trivial solutions to hard problems, not to find hard solutions to trivial problems.

Maintenance is hard work? Sure it is. Don't deny it — glory in it. Remember the findings of Daniel Couger and Robert Zawacki in their book *Motivating and Managing Computer Personnel* — DPer's are higher than all other professionals in their need for challenge and growth. If they want challenge and growth, they must go where the hard work is. At the same time, make sure that they have the tools they need, so that they know they're doing real work and not needless drudgery.

The key is order. The more disorder in the system, the more the drudgery. So be on the look-out for tools and techniques which add, reveal, impose or restore order, software tools which cross-reference, document or diagram existing code, "fourth-generation" language tools which reduce the amount of code to do the same functions, and restorative methods which upgrade spaghetti code to structured code.

And don't be reluctant to badger salesmen and consultants about your needs. When they promise miracles tomorrow with new systems, ask them what they can do today with existing systems.

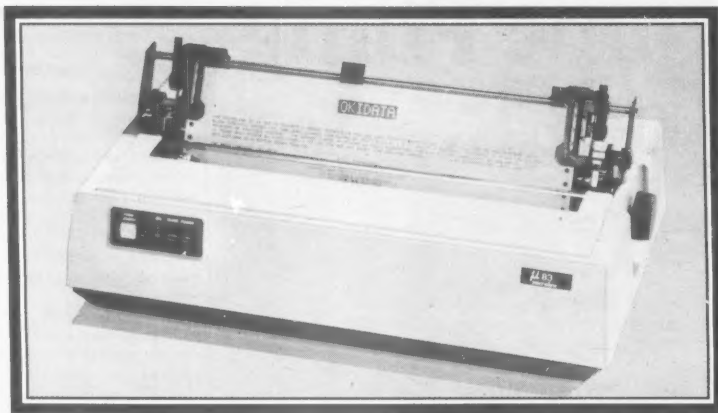
Maintenance is never finished? Well, yes and no. Each individual change is finished, but the maintenance programmer deals for years with the "same" system. But remember that the programmer gets a paycheck for years from the same organization. So continuity isn't all bad, sometimes it's job security!

Nevertheless, too much security can lead to stagnation and premature burnout of a valuable employee. Recognize and use the programmer's desire to see the system better as well as bigger. The programmer should be able to see perceptible improvement as well as a sequence of small changes.

Have a systematic policy of making the system simpler, stronger, more structured, easier to understand. When making substantial changes to any module, take the opportunity to upgrade the code, to remove out-dated branches, correct sloppiness and error, to systematize and document. Make sure that resources are available (say, 10% of programmer time) to upgrading and replacing old code with clean code

(Continued on SR/10)

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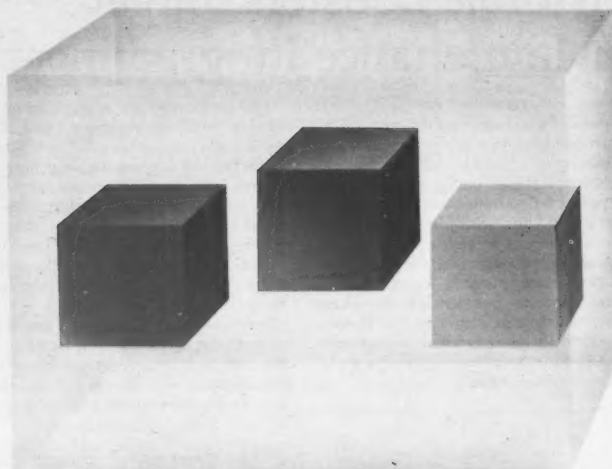
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The Transparent Single System Image Has Arrived!



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The complete "unified system" effect is achieved through combined use of three independent (but related) program products. Each of these, Super-MSI, MSM and GCD addresses distinct concerns present in multi-system environments.

Of course, since the products are independent, if you aren't yet ready for the full-blown unified system effect, you only need to select the products which interest you.

UNIFIED DATA INTEGRITY (including VSAM)



The Multiple Systems Integrity Facility provides the same thorough dataset integrity protection for jobs in **different** systems that would exist if the jobs were in the **same** system. In addition to propagating "standard" dataset integrity across systems, Super-MSI also insures that the VSAM "internal" SHR options are honored throughout your entire complex. Effective cross-system VSAM integrity can be obtained in no other way than through the use of Super-MSI.

Another feature: Super-MSI also **eliminates the hardware RESERVE lockouts** which are normally inherent with SHARED DASD in multiple system environments.

Much more besides: Super-MSI has many other exciting features including special aids for operators and TSO Users. All in all, Super-MSI will be a very powerful addition to your installation.

UNIFIED DEVICE MANAGEMENT



The Multiple Systems Manager manages the allocation of TAPE and MOUNTABLE DISK devices across all systems in your complex. It allows you to operate normally with **all** devices **ONLINE** to **all** systems. MSM insures that device allocation by jobs in different systems occurs just as if all jobs were operating in one single unified system.

MSM eliminates the operational burden of juggling TAPE and DISK units among systems. It protects against the danger of a system accidentally rewinding or overwriting a TAPE in use on another system; this removes the single greatest cause of shared tape mishaps.

MSM will use your TAPES and DISKS more efficiently — which can result in immediate device cutbacks or (more likely) postponement of future acquisitions.

MSM is so transparent that it can be operated without the use of any new operational commands. Of course, there **are** powerful new commands available — however these are extras, not necessities.

Only MSM allows such truly NATURAL and transparent shared device management.

Other features (for MVS environments only):

- The MSM Device Prefencing capability allows devices to be dynamically structured into a hierarchy of sets; MSM insures that units in preferred sets are used, wherever possible, before less preferred sets.
- The MSM **SOFTSWAP™** feature insures that DDR device SWAPS for TAPE units will **NOT** impact JOBS or TSO users which are not using tape allocation. Without **SOFTSWAP™**, TAPE DDR SWAPS are likely to impede all allocations in a system — including even those which do not use tape.

UNIFIED OPERATOR CONSOLES



The Global Console Director is an extremely flexible tool. It allows (selected) message streams from different systems to be logically "blended" to create a **unified system image** (to whatever degree desired). In a slightly different vein, GCD allows **any** console on any system to be logically attached concurrently (and perhaps in different ways) to any set of systems in your complex!

GCD allows commands entered from any console to be directed and processed anywhere in the complex; in this respect, all consoles are effectively linked to all systems.

In almost every aspect, GCD is philosophically and operationally compatible with the standard system console support.

GCD can improve overall throughput by simplifying operations. By allowing several physical consoles to be logically merged, excess devices can be eliminated for immediate savings, or deployed elsewhere to strategic advantage.

GCD is absolutely transparent to your users, and aside from major simplifications, nearly transparent to operations.

If you wish to use more than one of the above products, they can be integrated together into a single control task (thus further reducing overhead and complexity).

In nearly every instance where our products have been competitively evaluated against all possible hardware or software alternatives — our software has been chosen. Aside from IBM, Allen Services has been providing commercial software specifically designed for multiple system environments longer than any other company. Over 400 major installations throughout the world have already selected our products as the preferable means of handling problems associated with multiple system environments. The number grows daily. **Reliability** has always been an integral part of our design.

When considering software, most people consider **support** to be a very important factor — Allen Services has over 200 support personnel.

The only other comprehensive approach to unifying multiple systems is JES3 (or ASP). Aside from the fact that MSI/MSM/GCD can be installed and implemented in only a few minutes, there are several other significant differences from JES3: For example, MSI/MSM/GCD (combined) use only 1% to 2% overhead; MSI/MSM/GCD are invisible to your users; MSI/MSM/GCD were designed to be strictly compatible with OS/VS/MVS philosophies — in this regard none of your personnel will require re-training.

The majority of all eligible multiple system installations are now using our products to help manage their systems.

Because installations can have widely different characteristics, you may still have a nagging suspicion that our claims may not actually apply to your shop. To alleviate this doubt, we invite you to try our products (whichever ones interest you) at your own installation under your own conditions. This trial carries no charge and is without obligation. One word of caution: You're going to like them so much, you'll never take them out.



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'To Make A Long Story Short — It Was the Computer's Fault!'

Morale Boosters Target Maintenance Programmers

(Continued from SR/8)

that is functionally equivalent.

Remember that what you are maintaining is not code, but the business function served by the code. Programmers are like house-owners, if they're going to live with the system for a while, they appreciate the opportunity to make it a better place to live.

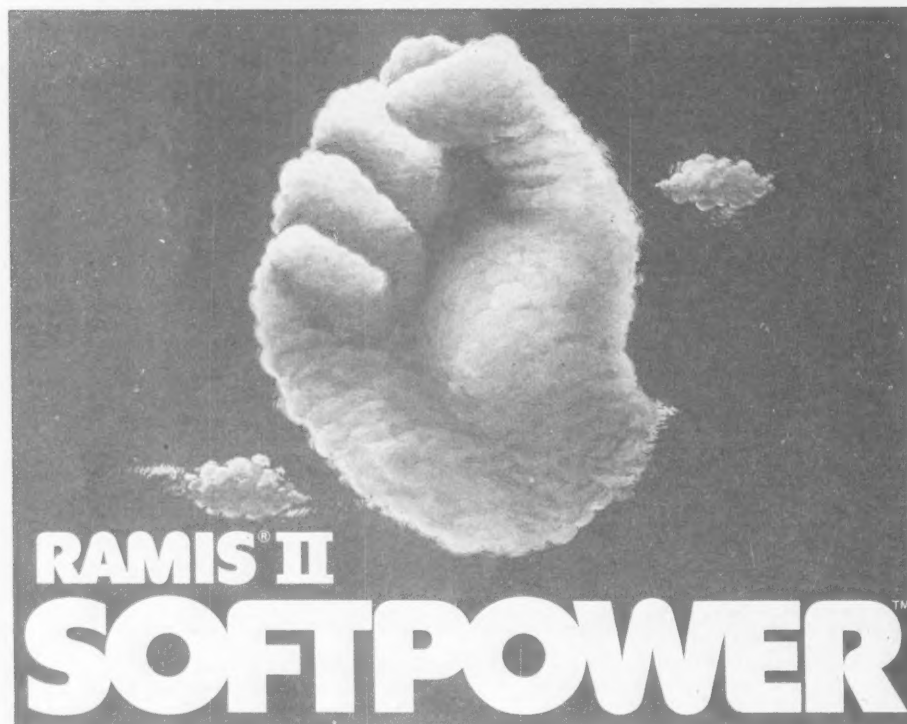
And, finally, they complain that maintenance doesn't go anywhere. This complaint comes in two flavors: it doesn't go anywhere career-wise, and it doesn't go anywhere in professional advancement.

The first complaint is in your hands to deal with. Maintenance work (and operations, too) is an attractive career path for the organizationally minded technician. The maintenance programmer has an unrivaled opportunity to learn both the existing procedures of the organization and its fast-breaking business and policy twists. It is an excellent basis for management advancement.

Remember that the star who develops an entirely new system often gets, as the next assignment, the job of maintaining it, so his career is still one step behind that of the star who goes into

'The maintenance programmer has an unrivaled opportunity to learn both the existing procedures of the organization and its fast-breaking business and policy twists. It is an excellent basis for management advancement.'

Most installations have a 2-3 year backlog of unimplemented applications



Turns backlogs into applications

RAMIS II is a complete information management system. It integrates an English-like nonprocedural language with a flexible DBMS. The DBMS permits the easy integration of data from a variety of sources, while the nonprocedural language lets you tell the computer what you want done without having to say how to do it.

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Because RAMIS II systems are simple to set up and modify, there is no need to develop elaborate specifications in advance. In fact, users report that basic requirements can be agreed upon and a prototype implemented in 1/3 the time it normally takes just to develop the specs. The data structures and reports may then be modified and enhanced in an

evolutionary manner until the system is fully operational.

Eliminating programming also eliminates the need to talk about programming. This frees the user and dp staff to concentrate on the problem rather than the code—which results in both better communications and a better system.

In business, to stand still is to fall behind. More cost effective hardware, an increasing demand for computerized applications, and the decreasing availability of applications programmers means even bigger backlogs unless more powerful, more productive software is used.

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maintenance in the first place. (Of course, there are still organizations which are in their first generation of computing, and therefore still need development stars above all, but such organizations are becoming fewer as DP moves into its maturity.)

The other half of the complaint is that maintenance programming doesn't go anywhere professionally. You hear this from staff who are more technically than organizationally oriented. Such staff are valuable to you and must be fairly answered. They point out that the articles in professional journals, the proposals from high-paid consultants, and the promotional literature from software houses is all about the techniques and opportunities and rewards of developing new systems.

Who speaks for maintenance? Turn this question around. Ask them, "If you want green grass, would you rather be in a pasture with a thousand cows or in the field where you are a pioneer?" It's easy to write programs and journal articles alone in an ivory tower, and it's easy to leaflet a business with brightly colored brochures of new products.

What's hard is to handle and understand the big, powerful, ornery systems that pay the bills in the real world. That's where the professional challenge is today. Remember that a recent poll of leading educators by Shetal Enterprises of Chicago, publisher of "Software Maintenance Newsletter" found that colleges don't teach maintenance because nobody knows enough about it yet.

Maintenance is still a frontier in software engineering.

Summing up, the main morale points for maintenance staff are:

- It's the life-blood of the business.
- Of course it's hard work.
- It's not meant to be finished — it's meant to be used.
- It's where the action is.

If none of this works, well, you may have selected the wrong types for maintenance work.

Zvegintzov is a consultant based in Staten Island, N.Y.

Work Quality Hampered Productivity Problems Traced to DPer Stress

By Benjamin S. Fialkoff, Ph.D.
Special to CW

Stress is a fact of life in almost any job in America today. It is especially hard-hitting to those who work mostly with their minds as so many DP professionals do. Stress can reduce quality of work and productivity in a number of ways.

First, stress can increase fatigue, increase errors and interfere with problemsolving and idea development. Second, stress can get in the way of smooth-flowing communication, reduce interest and enthusiasm and cause one to feel more negative.

Finally, stress can make you feel alienated from your family and even contribute to divorce. The high divorce rate among DP people is well known.

On the other hand, when stress is well-managed one feels an increased energy level, greater self-worth, experiences good feelings about oneself and has less personal downtime.

To understand more fully how stress can interfere with productivity it would be useful to define stress. Basing a large part of the definition on the work of the foremost stress researcher, Hans Selye, we can say stress is a person's response to a challenge.

This reaction takes place in the body as well as in the mind. We can say therefore that stress will show itself in a person's physical, mental and emotional life as well as in their performance.

Signs of Stress

Here are some signs of stress in the forms in which they interfere most. Physically, look for frequent headaches or other aches (back, neck). Frequent heartburn, diarrhea, constipation, stomach queasiness, excess weight, lack of appetite or increased appetite (especially if it immediately follows a crisis) are gastrointestinal signs of stress.

Constant fatigue and inability to sleep are further signs. Persistent sexual problems, premenstrual tension or missed periods are other indications, as well as increased smoking, shortness of breath and frequent sweating. Finally, use of antidepressants, tranquilizers, high alcohol intake or other mind-altering drugs can be symptoms of stress.



'Miss Pierce, Send in the Next Analyst for Project Review.'

In the mental-intellectual areas stress shows itself in the following forms: inability to concentrate; confusing or forgetting dates, places, times and other details; general disorientation; and lack of concern over real problems.

In the emotional area stress shows up most often as feelings of depression and anxiety. A feeling of being used-up or depleted is common, as are feelings of uneasiness, feeling unable to cope with life, a sense of despair about being a parent, reluctance to take a vacation, inability to discuss your prob-

lems with anyone, and an urge to cry.

In the performance area stress shows up in accident proneness; working late, more obsessively, or harder than usual (e.g. sleeping in the office frequently); an inability to finish a job before starting another. In the performance areas such signs as excessive frowning, lack of smiling, impaired dress or grooming habits are also tied to stress.

In the interpersonal areas stress makes itself known in the forms of irritability; trouble at home in the forms of frequent arguments or even vio-

lence as well as in the form of sexual or romantic indiscretions. DP professionals, like others under stress, often take out their stress on their families.

Stress in DP Operations

DP operations can be a source of stress in many ways. DP makes heavy time demands on workers. Managers often have phone interruptions at home. Often there is a call in the middle of the night, or even worse, the manager has to go in.

DP managers often are reluctant to

(Continued on SR/12)

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Productivity Snags Related to DPer Stress

(Continued from SR/11)

take sick days or vacations. DP professionals face the rapid pace of technological change — what you know can be obsolete in three to five years if you do not keep studying.

It is hard to keep up. DP can be a boring subject to discuss with those who do not understand it. If your wife does not, you can feel lonely. The need to take work home can interrupt home life — including sex.

DP professionals often have the belief that the job comes first. They get a feeling of excitement from working with the machines. The pressure from deadlines often comes from the reality that programming is still an art and therefore estimates of how long a job will take are often wrong. But stress can interfere with the ability to come up with creative solutions to programming and management problems.

The nature of the people who enter DP is also a consideration. They are often loners who are more comfortable with machines than with people. When they have to work with people after being promoted, especially when they have to work with users, there

can be trouble.

Programmers who are more comfortable working by themselves often lack skills in conflict resolution and communication. The crazy hours and deadlines are a further source of stress. The sedentary nature of DP work, sitting with a manual or in front of a CRT terminal, for example, can reduce fitness.

And if fitness is not kept up by physical exercise, the programmer or manager will yield to fatigue faster and will be less able to handle problems that arise.

This kind of stress can intensify to cause physical illness, instability, mood swings or even breakdowns. The stress the DP professional feels can affect his coworkers, wife and children. He becomes more sensitive to negative feedback from the organization, an event which occurs fairly often.

Some Solutions

The first thing which is necessary to increase productivity through fighting stress is to become aware of stress effects. One must discover the physical

and psychological effects of stress. What does stress make you say and feel? How does stress interfere with your relationships with your peers, boss and family? What qualities and processes in the organization are stressful?

Second, it is important to become aware that you are in control and can change. One of the important things to do here is to become aware of negative habits of thinking, which can get in the way and become excuses for not changing. Give up your excuses for not changing!

Next, it is important to look at each area and address the stresses within it. For example, make a list of stress situations and different types of stress.

Finally, make a plan for change. In the organizational area consider such things as compensatory time, flextime, getting family members involved as coworkers or support groups. Think of ways in which the organization can contribute. For example, some in-house gym equipment, workshops on communication skills, conflict resolution, or stress management may help.

In your own personal life be aware

that it is most important for you to care for yourself. This includes taking some time from the job at home to perhaps have a small, but definite amount of "quality" time with your wife and children.

Develop a set of goals for yourself such as weight loss, exercise and smoking reduction. Spend a few minutes a day to implement such goals. Furthermore, make an effort to understand what automatic thoughts are interfering with calmness and preventing you from going easy on yourself.

Productivity is important to all of us. Getting the job done quickly and well is satisfying and profitable. You can easily get lost in the details of the job, however, especially when the work itself is exciting, demanding and rewarding.

It is most important, therefore, to take time for oneself and one's family. Awareness of what stress is, its effects and methods for using it for your own benefit can go far to increase personal productivity.

Fialkoff is a senior staff psychologist at St. Vincent's Hospital and Medical Center in New York.

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Productivity or Serviceability?

Fixation on Productivity Can Undermine Service

By Jeanne Fitzgerald
Special to CW

Concentrating on programmer productivity may cause a decline in the service your department gives its users. To see why, let's use housework as an example to illustrate how a product is different from a service.

You can buy *products*, like dishwashers, vacuum cleaners and washing machines, to help you do your housework faster. But to use these, you must employ procedures which match the expectations of the product.

Dishes will not become clean, for example, simply because you have bought a dishwasher. You have to scrape the dishes, carry them to the dishwasher and load them in. You have to put detergent in the right place, close the door and set the controls. Electricity and hot water must be available. And when the dishwasher is through, you have to put the clean dishes away.

If, on the other hand, you purchase a housekeeping *service*, you have the right to expect your dishes to "become clean." You shouldn't have to do anything but pay for the service.

Similarly, if you use DP products, like software packages, they can help you do the work faster, but you — or your user departments — have to fit the applications to the products. Input and output must match certain formats. Fields and relationships have to be defined in certain predesignated ways. The more turnkey a package is, the greater the constraints are on your proposed application.

A DP service, though, should look at your proposed application, then design and build a system to take as much of the burden as possible from the end users. Input and output can be in the forms most needed.

Certainly a programmer using a package to set up applications can be much more productive, in terms of completed projects, than a programmer working on systems designed from scratch. But is this approach really more productive for the company as a whole?

Package Expert

When packages are used, you usually find, either among the programmers or in the user departments, the evolution of a new type of employee who we will call the package expert. This package expert knows how to make the package do what the department needs.

When the package expert is sick or on vacation, the other members of the department save difficult jobs for the day when he or she returns. The bad thing about this evolution is that the package experts usually develop from the most logical and intelligent employees in the department, who also know a great deal about their department's functions. Why should they be wasted in a job that is essentially that of a dishwasher operator?

Any method which treats a program or system as a product will probably increase programmer productivity. This includes the idea of building programs and systems from modules, sub-routines, or other parts; counting lines

of code per hour, day, or week; the use of minute divisions of labor; and the decree of particular methods by which you in the service that you can provide for your users.

This doesn't mean that you shouldn't

'Certainly a programmer using a package to set up applications can be much more productive, in terms of completed projects, than a programmer working on systems designed from scratch. But is this approach really more productive for the company as a whole?'

programming or system analysis must be done.

Any of these methods will also limit

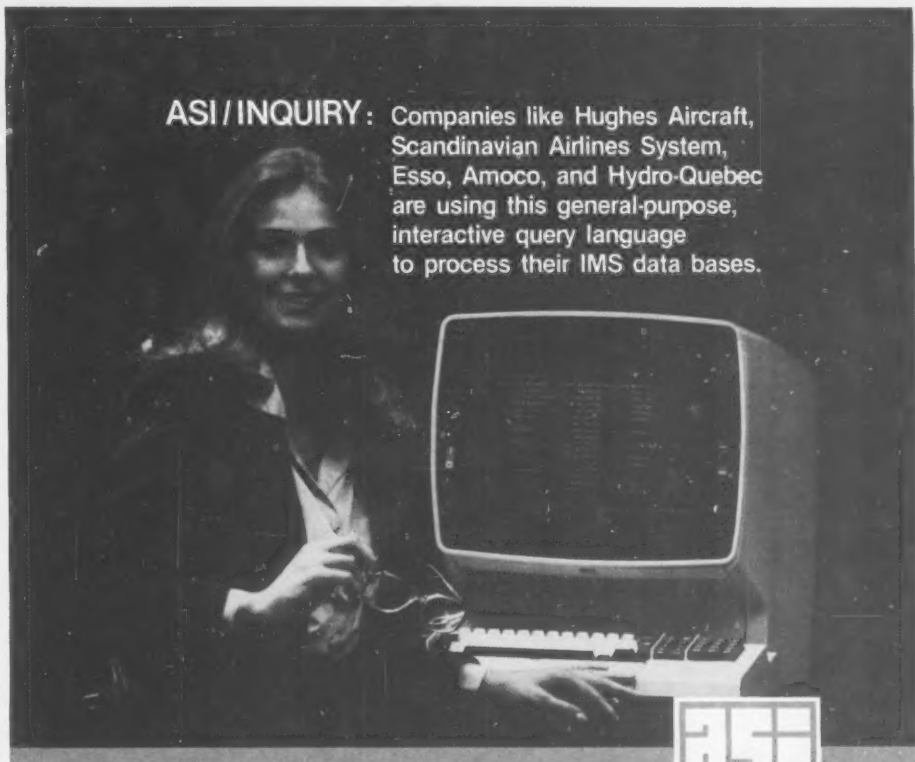
use these methods, but that you should realize that a corresponding loss of flexibility comes along with the in-

crease in programmer productivity.

Instead of concentrating on productivity, why not look at DP as a service that we perform in order to relieve users of tasks which don't require a human brain? Instead of counting the number of completed projects, why not consider the number of human brains which are turned to real decision-making as a result of our efforts? DP is a service industry, not an assembly line.

Fitzgerald is a communications analyst at Racal-Milgo, Inc., Miami.

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Productivity Means Delegating Responsibility . . .

By Scott O. Wilson

Special to CW

To increase the productivity of a project, the project manager must properly delegate the responsibility of planning and completing tasks on time. By clearly defining what is required and expecting the individual project members to formulate their own plans with

'Many managers still assign tasks to programmers with time and costs already determined . . . This procedure causes many problems, most of which will lead to a decrease in the desire of project members to meet deadlines.'

time and cost estimates, the manager will be in a better position to control the project and increase productivity.

Many managers still assign tasks to programmers with time and costs already determined. This is done because

the manager takes the responsibility to set up the project plan and includes detailed plans for each specific task within the project.

This procedure causes many problems, most of which will lead to a decrease in the desire of project members to meet deadlines and will actually decrease the amount of work be-

ing accomplished.

There are several problems with this approach.

Since the person doing the work did not make the estimates, the incentive to complete the job on time is reduced. This is because if the job is completed on time or ahead of schedule, the person making the estimates can take the credit by saying, "See, I told you so. Without those tight schedules we would not have completed on time." On the other hand, if the project is late or over cost, the estimate maker can say, "You just didn't try hard enough. I could have done it."

Predetermined estimates also allow an out for those not able to meet deadlines. These people can always say, "I never said I could do it." If a task begins to fall behind schedule, there is little incentive to make up the time through the use of overtime or rearranging other commitments.

Estimates created by the project manager usually preclude tasks from being completed early. The best that can be hoped for is an on-time task. This is due to the fact that work assigned will always expand to the time frame allotted when there is little incentive to complete a task ahead of schedule.

Assigning Responsibility

Now that we have looked at the problems of predetermined estimates, let's look at the advantages of delegating the estimating responsibility to the individuals who will actually perform the tasks.

By requiring programmers and analysts to develop their own time frames and costs, you place the responsibility for costs directly at the level at which the costs are generated. This usually means that the person who is best prepared to evaluate what will be required to complete a specific task is the one who will develop the estimates.

All too often we lose sight of the fact that the project manager is not the one generating the entire project's costs. He or she may have the overall responsibility for the project's cost, but the costs are generated by the programmers and analysts on the project. By instilling time and cost responsibility at this level, costs of a project can be reduced.

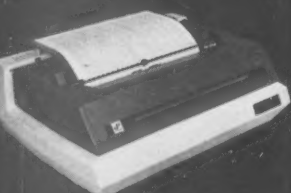
The awareness of the project members to the actual costs of the jobs being done will be increased. In many organizations, individual programmers and analysts are not fully aware of how much money they are really expending on jobs.

Their emphasis is on getting

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the project done and making sure it works. However, this is only part of a successful project. The cost considerations on how they approach their work is becoming increasingly important.

Progress Records

When the procedures are properly established to require detailed plans with time and costs from individuals, a record will be maintained of how well individuals are meeting their own objectives. This will allow not only fair evaluations of individuals, but allow the project manager the tools to efficiently assign work.

Although it is obvious that

'The project manager must be a strong, confident individual who has the necessary background to challenge estimates that appear to contain too much padding. When the first plans are presented to you as manager, demand that the individual be able to substantiate all parts of the schedule.'

there are many advantages of delegating this responsibility, there are also two problems that must be noted.

First, most people, unaccustomed to creating time and cost estimates, will be on a learning curve for a period of time. From past experience, that time frame is about one month. During this time it is important that the reasons of having individuals create their own deadlines be explained.

There is nothing wrong with stressing the importance of time and costs to the people on the projects, and explaining the need to develop procedures to be used in determining who is capable of consistent time performance.

Secondly, the project manager must be a strong, confident individual who has the necessary background to challenge estimates that appear to contain too much padding. When the first plans are presented to you as manager, demand that the individual be able to substantiate all parts of the schedule.

To ease this procedure, a standard form for each plan should be used along with a free form section by the programmer, which indicates what type of testing will be done, how the test data will be created and so on. This type of procedure will not only help the individual formulate the plans, but will give the manager an idea of how realistic the plans are.

From experience, it is interesting to note that people are usually too optimistic about completing jobs. This is the first problem that the manager encounters when implementing these procedures. It is important that the initial plans created by the people be realistic and the time and costs obtainable,

From experience in delegating planning responsibility, productivity, as measured by the percentage of jobs on time and under cost, has benefited. Within one year's time, a project manager should be able to notice acceptance of the technique by those people who are able to accept the responsibility.

Those people who are able to come up with better ways of doing specific functions will begin to realize that there is now a mechanism for them to be recognized for their achievements.

On the other hand, it will become increasingly obvious that some project members are unable to accept the responsibility

of organizing their own work assignments. These people will usually move on to other organizations or projects where they can blend into the scenery and continue their poor performance and low productivity.

Wilson is a system supervisor for the Continental Corp. in Howell, N.J.

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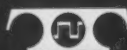
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Time Watchers Clock Performance Gains

By W. Dale Sims
Special to CW

With the growth of the white-collar working class and the lag in American productivity, increasing emphasis has been placed jointly on these two topics.

Most publications regularly feature articles on productivity. Many associations and organizations use productivity as the major theme of their meetings or seminars.

The emphasis has been concentrated on what tools or aids are available and can be supplied to the technical person to make them more efficient. Examples of these in data processing include on-

line programming, report generators, precompilers and testing aids. Many of the aids and tools have proven effective and allow the technical staff to produce more than the cost of the aids or tools.

Time Awareness Approach

There is another approach to increasing productivity that to date has been almost neglected: the value of time or time awareness.

Many companies have successfully implemented a time awareness program for their nontechnical staff and have experienced significant increases in productivity. These programs have

been called work measurement, work management, office controls and, most recently, quality circles.

One of the major reasons these programs are successful is that they simply make people aware of what is expected of them, the value of time, the value of quality and that work above and below performance can be recognized. As a result of this recognition a good performer can be rewarded and a poor performer can be counseled for improvement.

Most companies have not pursued a program for technical personnel time awareness. The usual reason is that these people are professionals and

should be treated differently. It is true that they are different, but it is also true that the same basic principles apply to them. The approach to how to develop and implement a program is what must be different.

Their difference is not a valid reason for not implementing a time awareness program for the technical staff.

The value of a technical person's time and the contribution he can make to an organization is great. A program to improve time utilization of this group of people can have a significant effect on a company's productivity.

Lack of Cooperation

It is also often thought that technical or professional people will not cooperate in the implementation of a time awareness program, that they will consider it to be beneath them or think they do not need to be concerned about their time usage since they can control their own work flow or work load.

This belief need not be true. A real professional will welcome any program that will in fact improve himself or his productivity. He will also welcome any procedure that will allow his contribution to the company to be recognized.

All too often technical people feel the company does not recognize their contributions. This is especially true if the company does not have a method of measuring these contributions.

Keeping Basics in Mind

If a company decides to develop or implement a time awareness program it should keep in mind the basics. An important ingredient to any program is to believe (and convey the belief) that people want to know what is expected of them and how they are performing relative to the expectations.

In a recent survey of 315 life insurance companies, only 52 indicated they have a procedure for measuring the productivity of their programmers. After further investigation it was found the majority of these 52 companies were using a rather informal version of management by objective and did not feel comfortable with the results they were achieving.

Companies have a great opportunity to increase the productivity and contribution of their technical staffs. If handled with top management support and developed in a manner that can accurately measure the productivity and contribution of a professional it will be welcomed by all who are truly professional.

Shouldn't your company consider developing and implementing a time awareness program?

Sims is president of Sharing Information Management Service, Sioux Falls, S.D.

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Signature

Ratio of Output to Input Firms Must Define, Measure Own Productivity

By Samuel R. Connor
Special to CW

Productivity, the ratio of output to input, of a DP function is neither clearly defined nor easily measured. Therefore, the first effort to improving productivity is to define it and specify how it will be measured.

Unless this is done, there is no way of determining what actions should be taken or what effect a particular action has on productivity. Since the actual output of a DP function varies from organization to organization, it is not possible to give a general definition of productivity: Each organization must determine its own.

Since productivity is a function of individual performance, the audit model is constructed of the four major factors that influence the overall performance of the group. These factors listed in order of their degree of influence are the manager, individual employee, department and organization setting. While each has a direct and independent impact on performance, each also has an interrelating influence on the other three.

A manager's competence is defined as the ability to organize and direct the allocated resources of a group — people, money, equipment — so as to achieve or exceed the group's assigned objectives.

Management Evaluation

In the past, there had been a tendency to promote the best technical performer into management as a form of recognition. Often the net result was to lose a top technician and gain a mediocre manager. Therefore, the first question to ask in your audit is, "Do I have managers who are managing or are they still technicians who spend most of their time doing the job?"

This assessment can only be accomplished by observing these managers on the job. Specific activities to audit are project management, department management and personnel management.

One indication of a manager's ability to manage a project is the number of revisions and changes required. Revisions and changes are frequently a result of a weakness in planning and project organization. Likewise, the inability to meet deadlines can be attributed to poor estimating and lack of control.

Many DPs have convinced themselves that estimates are merely guesses, and some guesses are worse than others. These managers tend to accept any excuse for missing a dead-

line on the basis that it was a poor estimate. Consequently, their inability to estimate work reduces project management control and decreases productivity.

Project reviews are necessary to ensure quality control. Unfortunately, the review pro-

cess frequently becomes a bottleneck. This is the result of too many reviews or too extensive a review process. Individual programmers and analysts have been required to wait for the review process to approve their work before moving on to the next assign-

ment.

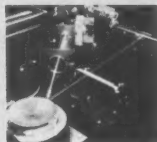
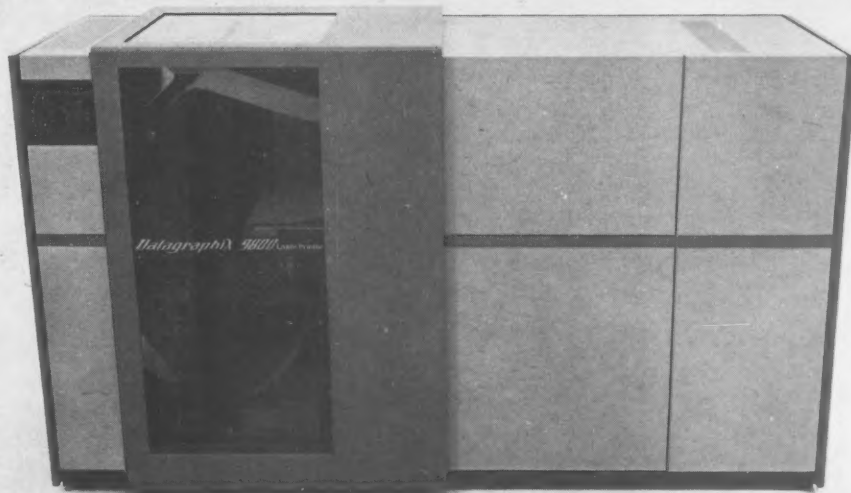
The manager's ability to manage the department is the next activity to be examined. Has he clearly defined the department's goals and priorities? If not, the net result will be people pursuing the wrong goals or putting too much or

not enough emphasis on a goal. This wheel spinning reduces the performance of the entire group.

Ineffective department management can also be traced to too many or poorly conducted meetings, a complaint of many
(Continued on SR/18)

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Each Firm Must Define Productivity Gauge

(Continued from SR/17)
employees. "Firefighting," — trying to correct the constantly arising daily problems — detracts from the major effort and thereby affects productivity. Most firefighting can be traced to poor planning and, in particular, the inability to anticipate.

Reducing Turnover

The last area of managerial competence to be audited is personnel management. Two of the easiest indicators to examine are the level of turnover and number of grievances. It may come as a surprise to some managers that they have a major responsibility for reducing turnover.

Contrary to what many managers think, an increase in salary is not the major factor for changing jobs. Other factors controlled by the manager that trigger turnover include a poor interpersonal relationship, unclear job assignments, not providing an opportunity for growth, boredom and uncertainty about career opportunities.

The second factor in the productivity model is the influence of the employee on productivity. Since individual performance is largely a function of ability and motivation, the auditor must examine both.

Deficiencies in ability can be attributed to lack of experience, lack of training, or requirements of the job being beyond the individual's physical or mental capacity. Since some people learn faster than others, the learning process must be planned and controlled for each individual. The time spent training and developing employees will, in the long run, have a positive effect on productivity.

All the ability in the world, however, will have little effect on performance if the individual is not motivated. The primary indicator of motivation is the person's interest and enthusiasm on the job. These attitudinal indicators are relatively easy to observe. The cause of low motivation, however, is more difficult to determine.

People work to satisfy specific personal needs. When needs are met, we experience high job satisfaction. An audit of individual performance should center on the factors of job satisfaction. These factors include achievement, challenge, responsibility, recognition, personal and professional growth opportunity and compensation.

The third factor in the model addresses the presence of support systems designed to increase productivity. These in-

clude the use of advanced programming techniques, such as structured programming, advanced languages with debugging capabilities and interactive programming.

The use of data base management systems and programming packages will reduce the need for maintenance and reprogramming. Readily

available reference material and up-to-date documentation can also improve productivity.


The last factor in the model is the organization itself. Are the rules and regulations imposed on the employees as appropriate for the data processing employee as they are for the other workers in the organization? Distractions such as

noise, temperature, space and light are known to have a negative influence on the knowledgeable worker.

Finally, organization communication and support, knowing what's going on outside the department, helps to build a feeling of belonging which encourages loyalty and commitment.

Increasing DP productivity is possible. It can only occur, however, by making a serious and systematic effort to understand what influences productivity. This model, while overly simplistic for clarity's sake, is intended as a start toward achieving that end.

Connor is director at Roberts Associates, Greenwich, Conn.



ARE YOU
TOO BUSY
DOING
YOUR JOB
TO GET
ANY WORK
DONE?

Motivation-Hygiene Theory Programmer's Job Service Averages 18 Months

By Kim Carlyle
Special to CW

Among the most serious problems in the DP industry is the alarming turnover rate of the technical professionals — systems analysts and programmers. Turnover is currently at a rate of about 28%

for the industry as a whole and 34% for programmers. The expected length of service for a programmer is approximately 18 months.

The problem is amplified because this is a technology-based profession. Even experienced professionals must un-

dergo some initial technical training and familiarization with the company's procedures and standards. Less experienced workers require more extensive training and orientation.

It is not uncommon for it to take several months before a

new hire becomes productive. This constitutes a considerable investment not only in the salary of the nonproductive employee, but in the costs of the resources, usually productive workers, diverted to assist in the training. Add to this the costs associated with the re-

cruiting function — advertising, personnel, agency fees — and it becomes a sum that no manager cares to expend every 18 months.

What causes computer programmers to change jobs so frequently? This question can only be answered if one understands the motivation of a programmer.

To explain programmer motivation, I chose Herzberg's motivation-hygiene theory because it is the result of a study of professional people, engineers and accountants, who, I believe, share some basic drives with DP professionals.

The motivation-hygiene theory states that two separate and distinct sets of factors are involved in producing job satisfaction and job dissatisfaction — hygiene factors and motivator factors.

Hygiene factors are related to the work environment. They include company policy and administration, relationship with supervisors, working conditions, salary, status, relationships with peers and security. These hygiene factors are the primary cause of unhappiness on the job.

Motivator factors are related to the job content — the nature of the work. They include achievement, recognition, responsibility, advancement and the work itself. Motivator factors are the primary cause of satisfaction and happiness on the job.

Hygiene Factors

First, the hygiene factors.

- **Company policy and administration:** I don't feel this factor is very significant in explaining the unusual turnover rate in DP. One reason is that company policy is generally very static. Policies rarely change and the programmer knew what he was getting into when he joined the company. Another reason is that policy covers the entire company, not just the DP division.

- **Relationship with supervisor:** This is often a cause of conflict within a DP group, but again it is not unique to the computer programmer and therefore cannot account for the unusual rate of turnover.

- **Working conditions:** Only in rare cases might this be a factor contributing to a programmer's resignation. For the most part, programmers have enjoyed working conditions far superior to their professional peers — the accountants and the engineers.

- **Salary:** This factor deserves considerable attention. It is cited most often as the primary reason for resignations where

(Continued on SR/20)

Most jobs can be divided into two parts: Meaningful work. And the time-consuming chores that keep you from getting to it.

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Programmer's Job Stay Averages 18 Months

(Continued from SR/19)

when other reasons are actually to blame. The individual may very truly believe that the reason he is leaving is because he is underpaid, however it is usually a secondary consideration — a thought that occurs after he is already dissatisfied.

Studies have shown that salary is the most important factor in attracting an employee to a new employer but has little bearing on a decision to leave a current employer. Salary has a substantially decreased importance once the individual is hired.

• **Security:** If a programmer is only half-way competent, he can still enjoy a very secure and rewarding career. This is unfortunate but it is a fact of life in DP. Security is not an issue for today's programmer.

Motivator Factors

Now for the motivator factors:

• **Achievement:** This is a true driving force for the DP professional. Few professionals have as many milestones. Only in rare cases could lack of achievement be a real reason for quitting a job.

• **Recognition:** This factor is commonly overlooked by all managers, including managers of programmers. Most people need to be praised occasionally. Recognition can take other forms such as promotions and bonuses and thus it becomes intermingled with

other factors such as status. Lack of recognition could be a cause for turnover but probably does not account for the high rate.

• **Responsibility:** Lack of responsibility can make for a frustrated programmer. Accountability without responsibility is often the problem for the programmer. The difference is

subtle and relates to the authority that is associated with responsibility.

• **Advancement:** If an ambitious individual perceives that his career goals are unobtainable or not obtainable in a reasonable time frame in his current environment, he will likely begin looking for a new position.

• **The Work Itself:** Computer work is not only largely technical in nature, but is a rapidly changing technology. A programmer that is away from his work for any length of time will de-

do is change the work itself.

My proposed solution, although apparently somewhat radical, is in fact becoming more common each day in DP centers. As programmers leave for greener pastures, do not replace them. That's right, don't replace them. Very simple. No programmers, no turnover. Who does the programming? Read on.

DP managers should select the individuals that they want to become future managers and system designers. These people are fairly easy to identify. They are the more senior of the programmers — those who have "been around" and are ready to settle down.

Concentrate on motivating, satisfying and retaining these people because, as managers and system designers, they must have an intimate knowledge of the company's business and policies.

As for the programming effort, contract it to an outside firm. An industry has developed over the years to provide this type of service — staff supplementation — programmers on a temporary basis.

This service satisfies the job content motivating factor of the programmer by giving him a variety of assignments with an average duration of approximately nine months. It satisfies the company's need for programming talent. And most important, it solves the turnover problem.

It also provides an alternative career path for those who want to remain technical. One can reap all the benefits of changing jobs — variety, interesting work and keeping pace with the state

COST ANALYSIS

Say we hire a programmer at a salary of \$25,000. We do it through a recruiting agency with a 25% fee of \$6,250. After one year, we give him a 10% raise. We include fringe benefits at 25%. Our hypothetical programmer leaves (on schedule) after 18 months. His costs would be:

\$25,000	1st year
13,750	2nd year (6 months) with 10% raise
\$38,750	Total Salary
9,688	25% Benefits
\$48,438	18 months salary and benefits
6,250	Agency fee
\$54,688	18 months cost
\$3,038.2	Monthly cost
\$18.30	Hourly rate (based on 166 hour/month)

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'Studies have shown that salary is the most important factor in attracting an employee to a new employer, but has little bearing on a decision to leave a current employer. Salary has a substantially decreased importance once the individual is hired.'

velop gaps in his knowledge. Many people are attracted to computer work because of the chance to be constantly learning new things.

What commonly happens to programmers is that they learn everything that their employer has to offer, (at least everything that they want to learn). They become proficient at the programming languages, operating system, business applications and so on, and their learning curve begins to level off. At this point, the job becomes increasingly less satisfying. Whatever has attracted the programmer to the employer, at least in terms of the job content, has disappeared.

The Solution

There are many reasons given by programmers for leaving a job. Some of them are quite valid, but I contend that the main cause of turnover in the computer programming ranks is that the work becomes increasingly less satisfying over time.

What alternatives does a manager have? Any good manager should be able to manipulate and improve upon most of the hygiene factors. Through job enrichment, he can attack most of the motivators. One thing he cannot

of the art — yet retain the same employer — the contract firm.

Contrary to popular belief, it is not outrageously expensive to use contract programmers. In fact, it often becomes economical. A cost analysis is shown in the figure.

The estimated hourly rate of \$18.30 does not include costs of training or miscellaneous recruiting costs such as personnel and management time. Nor does it account for the diminished productivity toward the end of the 18 months. This diminished productivity is a result of poor attitude of the employee, the time away from the job for interviews and the time spent on the telephone with agencies and potential employers. It likewise does not account for the negative influence on the rest of the staff.

Although difficult to quantify, a conservative estimate would be about \$20 per hour for programming talent. A more realistic estimate would approach the mid-20s.

You can get a good contract programmer for this price and not have the problems associated with a permanent employee.

Carlyle is an independent consultant.

DPers Highly Self-Motivated Five Obstacles Hinder Performance Measures

By Robert Keston
Special to CW

While DPers represent one of the most highly self-motivated groups of professionals, there are five major obstacles to measuring and improving their performance.

First, there is no standardized unit product in DP. If one produces widgets, at a rate of 200 per hour with a work force of 10, then personnel productivity is clearly equal to 20 widgets per person per hour (WPPH). The volume of widgets produced in relation to the number of employees on the line obviously represents productivity. Where is the equivalent unit product in DP? We produce systems, programs and information — but have not yet agreed on a common quantitative metric.

• **Fallacy:** Personnel effort equals productivity; or, action equals achievement. In the productivity scenarios run in our workshops, those playing worker and supervisory roles often object to productivity improvement programs on the basis that, "My people are already working as hard as they can!" There is a natural tendency to equate hard work with productivity, but this is not the case. Witness the demoralized systems development team whose hard-fought efforts are discarded as a result of management's failure to correctly perceive user requirements. The key, we have found, is not necessarily to work harder, but rather, to work smarter.

• **Fact:** The product is an end result useful to an external agency — the user. In order to crack this problem, the industry must begin to concur upon standard definitions of DP unit products. For evaluation of operational applications, we have utilized User Product Elements (UPE) with considerable success. UPEs are meaningful transactions with direct utility to user applications — that is, payroll checks, bills, weather forecasts, inventory orders and so on. Their benefit is self-evident because they must be produced. Other possible standard unit products could be related to programs, functional elements of code, documentation, on-line transactions and so forth.

Lack of Standards

We lack a common framework of industrywide performance standards. While there is a growing consensus as to the performance measures relevant to computer operations — reliability, on-time delivery of reports, on-line response time and so on — the systems development function does not readily lend itself to objective measurement. Nor has the industry agreed upon a common set of developmental performance measures or standards.

How much time and effort should it take to develop a payroll system for a medium-size manufacturing firm with 25,000 employees operating in the 48 contiguous states? We have not yet found a way of addressing such apparently reasonable management questions. Yet, comparable estimates are readily available in more mature fields. For instance, how much would it cost

to build a two-lane, medium-duty road of two kilometers length over level terrain?

In programming, we have found lines of code (LOC) to be meaningless as a rational measure of productivity. Only three to five out of the nearly 600 practitioners that we have trained make use of and believe in the validity of this approach! Unfortunately, LOC is one of the few performance variables for which there is a significant body of empirical data or comparative standards.

• **Fallacy:** Personnel productivity

'How much time and effort should it take to develop a payroll system for a medium-size manufacturing firm with 25,000 employees operating in the 48 contiguous states? We have not yet found a way of addressing such apparently reasonable management questions.'

can be measured without first measuring the productivity of the DP

function itself. It is unreasonable to hope to measure individual contributions to productivity without first having the ability to measure the performance of that function as a whole. We have developed such a framework that at least allows a start in this direction.

• **Fact:** Measurement is easy, but its significance is questionable without reasonable standards that indicate what is good, bad or indifferent. Relevant surveys by various industry associations could be most effective in developing units of productivity and
(Continued on 5R/22)

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Five Obstacles Hinder Performance Measures

(Continued from SR/21)
typical productivity factors.

Third, there are extreme inter-personal dependencies between DP job components. This is the traditional finger-pointing when faced with apparent individual performance deficiencies — "I can always blame it on someone else because the successful completion of my task is dependent upon Harry's submission of the file layouts [behind schedule], receiving the DBMS documentation [hasn't arrived yet] and availability of computer test time [the machine is down!]"

• **Fallacy:** Individual productivity can be measured independently of

other performers. Typically, little effort is made to control the interdependencies between job components as

'Almost any performance deficiency can be blamed on the failures of others. The solution entails clearer delineation of individual assignments as well as intensive supervision of interacting performers and tasks.'

signed to various individuals. Until this network of interdependent events

is controlled, the individual will be able to place the blame elsewhere and, likewise, management will often reward the wrong over-achiever.

• **Fact:** Almost any performance deficiency can be blamed on the failures of others. The solution entails clearer delineation of individual assignments as well as intensive supervision of interacting performers and tasks.

Lack of Correspondence

Fourth, there is a lack of one-for-one correspondence between personnel activities and systems performance. There is usually a rather direct relationship between employee tasks and

productivity in the more traditional manufacturing environment. If a production line worker fails to mount the right rear tire on a car, the result is clearly evident to the inspector at the end of the line (as well as to the driver who normally drives it off to storage).

Further, there is direct accountability, traceable to the actions (or lack thereof) of specific employees. In DP this direct cause-and-effect relationship is often not apparent. The effect of individual actions on ultimate systems performance is usually circuitous and indirect. This applies in particular to the systems development function. Another good example of this imperfect relationship is the work performed by systems programmers (technical support).

• **Fallacy:** The individual has a clear and direct influence on performance. The influence of employee actions on systems performance varies both in degree and proximity. For example, the computer operators have a high and direct influence on quality control in so far as they may be prone to mount the wrong tapes.

Conversely, the systems analyst may have a minor and indirect impact on reliability, in that a particular application is prone to reruns due to poor design or inadequate front-end edits. The problem is further aggravated by the fact that the key villain or hero is usually gone by this time, due to the high turnover in the industry.

• **Fact:** Performance is usually dependent upon indirect and elusive events. Again, it is necessary to gain a more formal understanding of the interactions between individual actions and ultimate systems performance in order to effect significant productivity improvements.

Fifth: We have yet to develop consistent work culture traditions that are useful in measuring and controlling performance. In fact, there is a popular mystique surrounding systems work that emphasizes the creative side of this art.

• **Fallacy:** Consistent performance management can be achieved without industry consensus and commonality of practice.

By comparison, the legal, medical and engineering fields have far more mature work traditions: the lawyer religiously records his time in 15-minute increments (for customer billing, of course), doctors use a reasonably common diagnostic terminology and the engineering notebooks have been around for many years. Eventually we will see the development of such formalized traditions in DP.

Dr. Robert Keston is president of Keston Associates.



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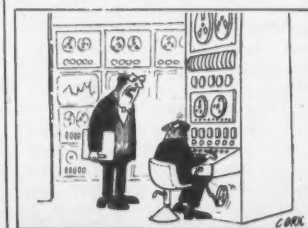
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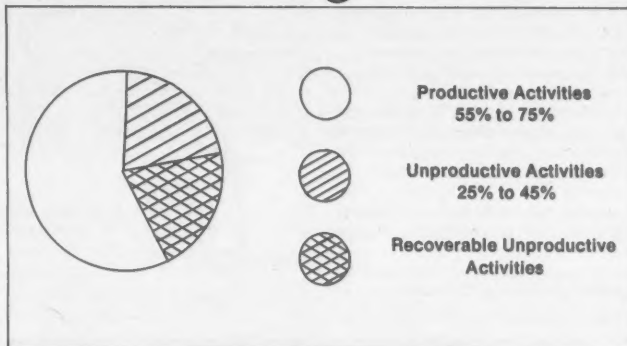
Without Government Action Can Management Change Productivity Trend?

By Vladimir Lich
Special to CW

Can management change the productivity trend of the last few years without some sort of government action? The answer clearly is yes! Studies of manufacturing, clerical and professional areas have proven that anywhere from 25% to 45% of all activity is spent on unproductive and unnecessary work (see figure at right).

To attempt to recover the full 25% to 45% is impractical. However, recovery of one half of the potential can result in leaps of productivity increases. This potential is a major part of the input in the productivity formula and is recoverable through an improved management system.

Productivity is a percentage of the output/input ratio. The output represents all goods and services produced. The input comprises the resources utilized to produce the output. The input in the government's calculation of productivity includes only one factor — labor hours. It is for this reason many



Average Worker's Productivity Profile

petitors in economic productivity (per labor hour we still excavate more cubic feet than any other nation). The concern is that the gap is fast narrowing.

What are the remedies available to management to correct or improve the effectiveness of its managing process? The answer seems to lie in better utilization

of another type of system is needed which, in effect, is responsible for managing these systems. This second category of systems is largely unrecognized in terms of its significance and even existence. This system can be called the *management control system*.

The primary purpose of the management control system is to involve all levels of management in providing support for the productive resources of the business. One basic ingredient of the system is a clear definition of outputs. Similar to the government's calculation of productivity, outputs of each organizational branch, area or department

must be clearly defined and measured to effectively monitor productivity.

Without proper output indicators productivity cannot be measured. The selection of appropriate output indicators, on the surface, seems very elementary to most managers. However, in many instances misleading indicators are selected.

For example, a salesman's performance and compensation is typically measured in sales dollars, which on many occasions has very little to do with his productivity. It is the number of customer contacts, the quality of the contracts and the amount of customer service that will tell us how productive he is. The sales dollars will be generated as a result of his productivity.

Productivity Losses

Unfortunately, when these key indicators are not periodically reviewed and otherwise controlled by management, the productivity losses might not be immediately obvious. As in the salesman's case, it could take certain customers a year before deciding to switch to another supplier. This concept applies to manufacturing, white collar and professional occupations as well.

The management control system continues... (Continued on SR/24)

'A key point, often overlooked, is that we are almost exclusively concerned with the percentage change in productivity and not the amount of output and input or the resulting percentage. The U.S. still outstrips competitors in economic productivity. The concern is that the gap is fast narrowing.'

people mistakenly think the labor force is at fault when productivity declines. Efficiency actually measures the rate of converting inputs to outputs.

To illustrate the minor role of labor, imagine a Japanese worker and an American worker excavating foundations of a house. The first year both use a pick and a shovel. In the second year a bulldozer is purchased for the Japanese worker. At the end of each year we will calculate their productivity by dividing their individual outputs (cubic feet converted to dollars) by the hours worked. No doubt, the Japanese worker's productivity will show a large productivity increase in the second year.

Another key point, often overlooked, is that we are almost exclusively concerned with the percentage change in productivity and not the amount of output and input or the resulting percentage. The U.S. still outstrips competitors

in the talents of individual managers in the organization through a system demanding the involvement in operations and sharing the talents of key managers.

DP vs. Management

Every business, regardless of its purpose, depends upon a multitude of different systems to assure an organized, properly focused approach to accomplishing its objectives. For our discussion purposes we will divide the systems into two categories.

The first category can be called DP systems and consists of manual and computerized systems by which industry operates. Included are production control, accounting, statistical reporting, manufacturing data, inventory control, purchasing, costing, order processing and a seemingly infinite number of systems.

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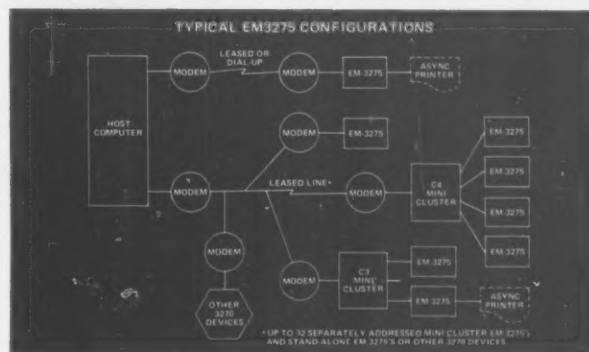
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Can Management Improve Recent Productivity Trend?

(Continued from SR/23)

sists of proven business management principles applied in a practical manner to a particular operation. The individual parts of the system are:

- Advance planning of each organization's activities, considering the resources and skills available and periodic adjustments.

- Method of assigning planned activities to qualified people, clearly communicating the objectives and the expectations.

- Effective method of monitoring the completion of assignments in a practical and supportive manner.

- Effective reporting of performance and problems encountered. Participation of appropriate management personnel in problem solving.

Top management's commitment is the key to a successful implementation of such a program. However, without properly defined output indicators and a formal written set of procedures specifying management's responsibility and frequency of communication at all levels of the organization the improvements will be short-lived.

The person implementing such a program must have a good grasp of the subject of human relations and motivation and its effect on productivity. The management control must be viewed as supportive, not threatening, by managers and employees, or such a program can have a negative impact on productivity.

The results of a productivity program vary from business to business and department to department depending on the potential (the 25% to 45%), the recoverable portion and management's commitment to such a program. Post-implementation results of a well-designed program typically reach a 10% to 15% productivity increase within a relatively short period. As the program gains maturity an additional 10% can be expected before leveling occurs.

These concepts of the productivity program are applicable to DP areas. Many DP installations now have a system in place that prioritizes and measures most or all of the incoming work, assigns projects to teams or individuals based on skill levels, monitors the completion of the assignments and reports the performance.

It is the lack of consistent application of these management principles that result in productivity losses. There is nothing more frustrating to a programmer than an unclear assignment requiring days to comprehend and formulate an approach.

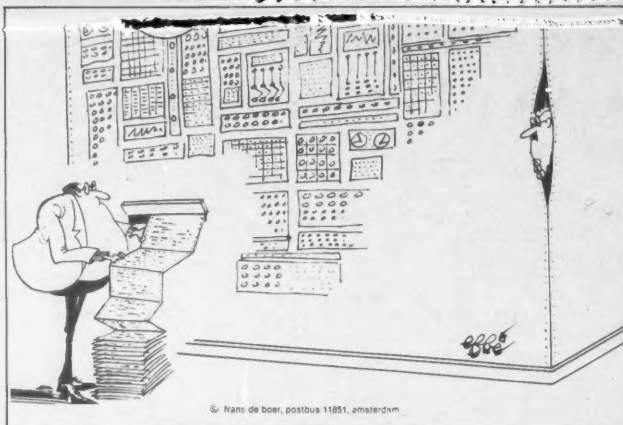
An effective follow-up system would quickly identify this problem and an hour of the manager's time will provide the solution. When the follow-up is performed in a supportive manner it is the man-hours saved and the positive effect on the programmer's motivation that will result in a greater productivity.

In large organizations schedule interruptions occur in varying frequencies from top executives. The management information systems executive is responsible to:

- Be aware of the effect on productivity and morale of his people.
- Deal with these interruptions.
- Communicate his decisions to lower level managers.

Interruptions, properly evaluated — and the urgency effectively communicated — can result in increases, rather than decreases, of productivity. The consistency of applying proven management principles will be conducive to a positive and productive environment.

Lich is a senior consultant with Alexander Grant & Co., Cleveland.



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To Cut Costs Up to 75%

Three Factors Top Productivity Considerations

By Robert A. Smith

Special to CW

Computer programming costs have risen dramatically over the past few years, while most other computer costs, particularly hardware, have declined substantially. This increased programming cost has been accompanied by a less than comparable increase in programming output.

Consequently, computer programming productivity has become the subject of considerable interest to both general and DP management. Therefore, significant time and effort is be-

ing directed to increasing programmer productivity in systems development and maintenance through both decreasing the per unit cost of programming and increasing the level of output for a given amount of programming resources.

Logical Extension

In a sense, these efforts are a logical extension of computer performance evaluation efforts. The principal difference is that computer programming productivity is concerned with making people, as opposed to machines, more

productive.

In pursuing this objective, all the various facets of computer programming can be considered for possible improvement in productivity. These include programming methods; programmer, user and management personnel; equipment; software; and facilities. More specifically, however, there are three major factors extending across all of these considerations that should be taken into account.

These are programming activities that incur the bulk of the programming costs and therefore provide the

greatest opportunity for payoff, programming activities that are more procedurally oriented (are less of an art form) and therefore offer greater possibility for the effective use of programming productivity aids and determining productive environmental conditions.

(Continued on SR/28)

Productivity Checklist

- Competitive bidding for systems development efforts.
- Formal user and user management review and approval procedures.
- Open-shop programming.
- Long-range strategic planning.
- Formal project resource estimating procedures.
- Project management planning and control systems.
- Resource accounting/customer charge-back system.
- Project management/matrix management structure.
- Systems development and maintenance procedural and production (quantitative and qualitative) standards.
- Combined development and maintenance programming vs. separate development and maintenance programming.
- Dedicated minicomputer for programming work.
- Progressive approach to systems development (subdividing to workable units).
- Top-down analysis vs. bottoms-up approach.
- Information flow and data analysis vs. data flow analysis.
- Problem statement and requirements specification language.
- Systems quality performance definition and performance evaluation procedures.
- Automated system design methodology.
- Modular design.
- Incremental development approach.
- Successive iteration/convergence.
- System simulation/modeling.
- Deemphasis on extremely efficient code.
- Application software package.
- Contract programming.
- Interactive on-line programming including debugging.
- Structure programming.
- High-level programming language/macro programming.
- Nonprocedural languages.
- Reusable code.
- Data dictionary.
- Data base management systems (DBMS).
- Inquiry systems.
- Transaction processors, program generators, application generating systems.
- Report generators/writers.
- JCL generators.
- Chief programmer teams vs. unstructured teams.
- Development support libraries.
- Programmers' workbench.
- Automatic flowcharts/documentors.
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- Formal testing procedures.
- Formal change control procedures.

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Insurer's Policy of 'Working Smarter, Not Harder'

By David Fogelson

Special to CW

WATERLOO, Ont. — At a major life insurance company here, a complete change in management style and employee attitudes is taking place as a result of the company's ongoing emphasis on productivity improvement.

According to Jim Soltysiak, Dominion Life Assurance Co.'s superintendent of general services and productivity coordinator, the new emphasis at head office boils down to "Working smarter, not harder."

To date, results of the productivity emphasis include:

- Increased participation of staff in

improving productivity and solving work-related problems.

- A clearer perception among staff of departmental goals and company

mission.

- A greater acceptance by staff for work responsibility.
- Improvement of total work envi-

ronment.

- In many cases, elimination or significant reduction of work processed in "bits and pieces" which proved

Three Items Top List of Considerations

(Continued from SR/27)

ditions and programming processes that can be readily adapted to a given DP installation.

The first of these factors entails consideration of the distribution of programming effort between the different phases and activities of the computer systems life cycle. A not unusual allo-

cation of programming resources to the major phases is as follows: development, 40%; operations, 5%; evaluation, 5%; and maintenance and modification, 50%.

Within the development and the maintenance and modification phases, programming resources are often allocated as follows: preliminary review

and planning, 5%; requirements analysis, 20%; systems design, 10%; coding, integration, testing and debugging, 40%; documentation, 10%; implementation, 5%; and administrative and clerical support, 10%.

The significance of this is that the activities incurring the bulk of the programming effort, and therefore probably offering the greatest opportunity for improvement in programmer productivity, are the coding, integration, testing and debugging as well as documenting activities of development and the maintenance and the modification phases. This accounts for approximately 45% of all programming effort.

The second factor concerns the applicability of hardware and/or software programming aids. These are most likely to be usable and contribute to an increase in programming productivity, where the programming activity is most procedurally oriented, or rule governed, and less of an art form.

The third major factor to be considered is the possible changes in existing environmental conditions and programming processes that may contribute to increased productivity. The following considerations extend across all facets of computer programming and represent both complementary and competitive approaches to the objective of increasing programming productivity.

This encompasses both initial development and subsequent maintenance efforts. This is not intended to be a comprehensive list of all environmental conditions and programming processes, but rather a survey of some newer ideas, methods and software (see list on SR/27).

Programmer productivity measurement must be accomplished if programming productivity improvement efforts are to be demonstrably effective. Such measurement should identify and illustrate the effect of planned changes in environment and processes, provide a means of assessing staff performance and facilitate planning, particularly in estimating systems development and maintenance resource requirements.

They should consist of both quantitative and qualitative measures of production. Typical examples of such measures would include programming output per unit of input, variance in scheduled vs. actual time and resources to completion, degree of fulfillment of user requirements, lack of requirement for and ease of necessary maintenance, variance in scheduled vs. actual operations time and cost and existence of a viable alternative method.

The use of programming productivity improvements can reduce systems development cost by as much as 50% and program maintenance cost by as much as 75%.

Smith is vice-president and general manager of WMS, Inc.

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Reaps Changes in Management, Staff Outlooks

time-consuming and less satisfying for staff.

• The potential to process significantly greater work loads by fewer staff.

Elements to Campaign

Dominion Life's productivity improvement drive is comprised of work effectiveness, participation teams and flexible performance appraisal.

Work effectiveness is a productivity/job improvement methodology developed by the management consulting firm of Roy W. Walters & Associates, Mahwah, N.J. It is based on the premise that most people are capable of doing far more than their present jobs require or allow and focuses management's attention on the human aspects of organizational productivity.

Participation teams is a concept similar to that of the quality circle concept developed in Japan after World War II. It nurtures a sense of "job ownership" among workers by having them solve their own work-related problems.

Flexible performance appraisal is a system tailored to the performance goals of each job, clerical and non-clerical, which, as a result of the total productivity improvement emphasis, have become more clearly defined and measurable.

"To be successful, each aspect of the campaign requires a work environment that permits freedom of expres-

sion," Soltysiak said. "Management style must change to permit and encourage this, and workers must learn to challenge their work from the standpoint of finding the most effective way to do it and follow through by making appropriate suggestions to management."

Work effectiveness includes tools designed for thorough front-end analysis and helping management identify the nature and severity of present and potential productivity problems. It also provides for a workable action strategy for redesigning jobs and entire departments.

Employee's Workshop

Robert Janson of the Walters organization met with the productivity committee and observed the nature of the work flow during a tour of the head office. Under his leadership, company officers, department managers, administrative supervisors and other specialists participated in a three-day workshop.

On the last day of the workshop, the results of the initial research were reviewed, and managers began to develop work-effectiveness action plans for their departments. A one-day orientation session of work effectiveness theory was also held for all employees. Following the workshops, administrative managers and facilitators conducted more comprehensive diagnoses

of their departments.

The results of each diagnosis were used to develop a more detailed departmental action plan incorporating specific improvements to be made to jobs and work systems and results expected.

Core Job Dimensions

This analysis includes personal interviews of all employees plus data gathered from the Job Diagnostic Survey (JDS) that the employees completed. The JDS measures the presence in jobs of proven motivational and job satisfaction factors called core job dimensions. The Core Job Dimensions are:

- Skill variety — the job requires the employee to use a number of talents and abilities and ideally, to keep developing and acquiring new ones.
- Task identity — the employee does a "whole job" from beginning to end with an identifiable outcome.
- Task significance — the employee can recognize that his or her work has meaning to other people, inside or outside the department or company.
- Autonomy — the worker has substantial discretion in decisions that affect his or her job in such matters as scheduling and work methods.
- Feedback — the employee gets continuing, relevant information about the effectiveness of his or her work; ideally, feedback comes from bench-

marks in the job itself.

Jobs that encompass these characteristics are more interesting and motivating for the job incumbents.

With the department's and organization's human resources more effectively utilized, productivity increases, the quality of services improves and costs are reduced, according to Soltysiak.

Get 'Greenlight'

After the interviews and JDS were conducted, departmental participation teams made up of employee representatives and their managers met to "greenlight" their jobs — identify work-related problems and recommend solutions.

"While the decision-making authority remains with the department manager," Soltysiak said, "this system is preferable to the method where the boss tells his employees how to solve the problem."

"There is no question that staff was more receptive to the changes and committed to seeing the new system work because they had a big part in making the changes," according to Soltysiak.

Fogelson is an account group manager for Keyes, Martin & Co., Springfield, N.J.

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Application Generators Anticipate Requirements

By Jerrold M. Grochow

Special to CW

In the 1960s, we developed most of our medium- and large-scale systems in Cobol, which reduced the amount of code we had to write vs. assembly language. In the 1970s, we tried packaged systems, which were supposed to eliminate the need to write any code at all.

Now, we have learned enough to realize that the Cobol approach still requires us to design and implement code measured in the hundreds of thousands of lines, while the packages are themselves very complex programs (usually poorly documented internally), and, therefore, difficult to modify.

Obviously, we need to find yet a different approach, one which incorporates the benefits of the packaged system and the flexibility of writing a custom program. That approach is to use an application generator as a tool to design and develop our systems.

Just as a packaged system anticipates the requirements of a variety of organizations in which it will be used, an application generator anticipates the requirements of a variety of applications, at least to the extent that those requirements are in common. Additionally, however, an application generator provides programming language capabilities to develop those parts of the application which are not common or amenable to a more pack-

	Anticipation of Functional Requirements	Data Management	Specialized Language	Screen and Report Generation	Design Methodology
Generation Five	X	X	X	X	X
Other Application Generators			X		
Typical DBMS		X			
Typical Report Generators				X	

aged approach.

For example, every financial system processes input transactions to ensure

Dimensions of Application Generators

their validity. Usually, these validity checks include such standard processes as batch totalling, making sure that debits equal credits, checking account codes and organization codes against master tables.

A good application generator should automatically provide a transaction input capability (which would require only a definition of fields to be present on the transaction), automatically perform certain edit checks based on assignment of standard field names (for example, adding all of the positive and negative amounts separately in a field named Dollar Amount to ensure that debits equal credits) and provide a flexible language capability for performing other edit checks that may vary from application to application.

A complete application generator should also provide an integrated data base and report generation capability so that the user does not have to combine a number of different tools which were not designed to work together.

Generation Five

In 1975, American Management Systems, Inc. developed Generation Five, an application generator that meets these requirements. The name signifies the fifth generation of software development languages or the five major components of an application generator: anticipating functional requirements, data management, specialized language, screen and report generation and design methodology.

Generation Five allows either batch or on-line input (with no change required in any user programs) and is available on both IBM machines and minicomputers for distributed processing applications.

The productivity of our own service bureau programming staff has increased dramatically since they began using Generation Five. We previously experienced the usual 50% to 60% of

our staff working on maintenance programming; we now find that only 20% of the staff are devoted to maintenance, yet they are providing applications for three times as many clients. We have experienced a similar productivity improvement using Generation Five for our systems development projects and for our packaged software development.

This dramatic increase in productivity of system developers has occurred for three major reasons.

Generation Five applications require 50% to 75% less code than applications written in Cobol since much of the housekeeping code in a typical financial application is provided automatically by the product and thus does not have to be designed or programmed. Not only is implementation time shorter, but maintenance is decreased as well.

It decreases design and testing time because the analyst no longer has to design the process to read files, determine when he is dealing with a new document or batch, perform summarizations and so on. Since debugging the program's logic flow is often the most time-consuming debugging task, we have found that system testing time has been disproportionately reduced over Cobol programs.

Because Generation Five provides a predetermined (although highly parameterized) program flow and structure, all applications are similarly structured, allowing programmers to shift from working on one application to another with a relatively short training period. In effect, it provides an inherent design methodology and program structure.

An additional benefit is it allows us to use less experienced programming personnel and still be assured of having an efficient application. The language components of Generation Five will

(Continued on SR/32)

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Job Interview the First Step

Smart Hiring + Training = People Productivity

By Howard Marshall James Jr.
Special to CW

The first step to increasing people productivity should be to take appropriate measures to protect against hiring nonproductive employees.

The job interview is very important in accomplishing this task. The educational background and work experience shown on a resume are not enough to assure competence. Many technical interviewers are not as well trained in interviewing as are personnel department interviewers. Consequently, they do not know exactly what questions to ask. If this lack of interviewing expertise is as prevalent as it appears to be, many companies will be lucky not to build a DP staff with a high percentage of nonproductive or counter-productive individuals.

There seems to be a simple solution to this problem. Companies should have interviewing standards that include asking predetermined questions for each job type and even more specific questions about the particular type of system with which the programmer or analyst will be involved.

One other important factor that hiring managers and other technical interviewers should consider is to clearly and precisely describe the details of a job, both good and bad.

Training in Basics

The second most important factor necessary to increase people productivity is training.

First of all, every programmer and analyst in a DP department should have a strong background in basic DP principles and concepts. I have noticed that DP students and programmer trainees understand higher level concepts much better when they are well versed in the basics. Many experienced programmers and analysts are weak in the basics.

The method used for training should be carefully planned. For many, classroom instruction is much more effective than self-training video courses. However, there are those who prefer the video courses.

Programmer trainees should be exposed to state-of-the-art techniques, but should not be deprived of learning older methods of programming, especially if they will be responsible for maintaining programs that fall into this category.

Experienced employees should be encouraged, if not forced, to keep abreast of the latest technological developments. Falling too far behind will eventually result in an adverse effect on productivity.

On-the-job training is very important for programmer trainees. They need close guidance. The job training mentor should have good skills as well as years of experience and should be capable of communicating downward.

Management must give a higher priority to training or they will face the inevitable vicious cycle of rookies learning from veterans who have limited knowledge who in turn use that limited knowledge to teach rookies who follow them and so on.

A third variable in the productivity

formula is the work environment. Work environment might be considered in two parts: the physical environment and the human environment.

From the physical standpoint, studies have shown that aesthetics play an important part in how people function on the job. Noise level, lighting, temperature and similar elements affect workers' attitudes. The location of a person's desk, in an office vs. an open landscaping environment, seems to also play a tremendous role in level of productivity.

Along the same line, an office with

one individual provides more privacy than most open landscaping arrangements and therefore would tend to provide a more positive environment in terms of productivity. Of course, as the number of people in an office increases, the level of productivity stands a chance of deteriorating somewhat. The key here is privacy.

From the human standpoint of the work environment, the personality traits of individuals, especially those working close together on a project team or the like, play an important part in how productive the team as a

whole will be. Management must be careful in selecting individuals to be project leaders and project team members.

Care must also be taken in selecting liaisons between the DP department and the user departments. Consider, for a moment, a project leader who tends to retreat to his corner to do "his share of the work" or a quick-tempered senior analyst who meets with the user department to gather information that is vital to the project and ends up arguing with the user.

(Continued on SR/32)

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Application Generators Anticipate Requirements

(Continued from SR/30)
appear familiar to any Cobol-trained programmer. What he or she will primarily have to know is what is automatically provided and, therefore, does not have to be programmed.

Market Entries

In the past year, every major supplier of data base management systems, including IBM, has announced its entry into the application generator or application development facility marketplace. Their products have one thing in common: they are all a combination of independently developed tools based around a specific data base management system.

They include IBM's Application Development Facility and Development Management System, Cincom Systems, Inc.'s Total information system, and Cullinane Database Systems, Inc.'s IDMS-based product line.

All of these tools have some of the components mentioned above, namely, some program functions are provided automatically while others must be performed either in Cobol or using a specialized language (usually for report generation). None of them, however, is oriented towards a specific class of application such as financial management systems or manufacturing systems. Therefore, they do not include special facilities that might be common to these applications (see diagram on SR/30).

Unlike other application generators, Generation Five was designed specifically as an application development tool for financial systems, a fact

which is reflected both in the automatic features and in the accounting-oriented language (for example, Debit and Credit and Post [to ledger] are typical key words.)

Its data management facility was also developed for financial applications (based on a relational model) and thus does not have a number of more generalized (and more resource-consuming) features of the core data base of these other products.

While this may mean that not every application in an organization will use a Generation Five data base, those that do will run more efficiently. Furthermore, to increase its usefulness in DP shops with a large number of existing applications, its data base can be accessed by non-Generation Five programs and Generation Five programs can likewise access non-Generation Five data bases. This two-way communication is missing in whole or

in part from most of the other application development tools on the market.

We believe that application generators are still in their infancy. As more and more people realize that packaged systems alone will not satisfy their needs, but are still unwilling to pay the price of a custom system, the demand for more sophisticated development tools will increase.

With IBM's entry into this

marketplace, the concept of introducing sophisticated development tools that may include a new language into an existing data processing shop has been further legitimized. The 1980s may very well be the first decade in which we see an order of magnitude improvement in system productivity due to the introduction of application generators.

Grochow is vice-president of American Management Systems, Inc. in Arlington, Va.

Smart Hiring Bolsters Productivity

(Continued from SR/31)

There are others, not so visible, who can make or break a project. Consider this scenario: an egotistical programmer develops some extremely difficult logic and is very upset when the project leader restructures that logic so that it will be easier to maintain. The programmer refuses to do any more than is absolutely necessary to get his job done or to assist others from that point on. Managers should make special efforts to pay attention to the attitudes of new employees and to study the attitudes of all of his subordinates on an ongoing basis.

Utilizing Computer Time

The fourth variable in the productivity formula, and probably the most apparent in most DP shops, is machine utilization. The computer is, by far, the number one tool of the programmer, and when it is not available, productivity may very well decrease. A very effective method to combat this is to overlap machine

work and desk work. In other words, while one or more programs are being compiled or tested by the computer, analysis and further coding should be in progress.

This overlapping philosophy is inherent in systems that are designed using a structured approach and a modular concept. Using this approach, the design of specifications for one program module may be in progress, while another is being coded and another is being tested.

In some cases the computer may be available, but the terminals, through which the programmers often communicate with the computer, may not be available — either because the terminals are inoperative or are being used by someone else. When this happens, if there is no desk work to overlap the machine work there should be some other vehicle, like card batch access, to manipulate data files that are normally manipulated on line via the terminal.

Machine performance has more of an impact on programmers than analysts. When a programmer runs

back and forth to the computer room to see if his job has printed or sits in front of a terminal waiting for a response to a command, he is being nonproductive. A better knowledge of how the computer works would help the programmer be more productive.

Most installations have information available that will tell programmers exactly when the peak processing hours are and which computer resources are most heavily used during these hours. With this information, management can coordinate work schedules of data processing personnel to offload some of the processing from those peak hours.

There is one other variable I think has an impact on productivity — promotions given without proper training and/or employee's desire to be in the new position. The only remedy is for management to determine what each individual's job interests are and to make promotions accordingly and train those promoted.

In closing, increasing people productivity seems to rest more on the shoulders of first-line DP managers than on anyone else, save the individual employees themselves.

Howard Marshall James Jr. is a lead programmer/analyst at the Federal Reserve Bank of Philadelphia.



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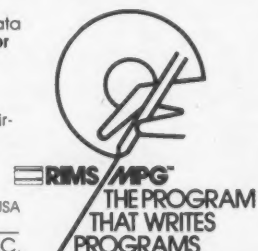
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Who's Responsible? In Productivity, Accent Should Be on 'Product'

By Clifton L. Moss
Special to CW

The hue and cry of management during the recent DP personnel shortage has been, "Improve productivity!" Not surprisingly, the DP community has gone off muttering to itself, "We're putting in 10- to 12-hour days now! What more do they (management) want?"

The problem is that considerable effort is spent on projects that have relatively little importance to corporate goals. As a result, insufficient time is expended on the critical activities required to produce an information systems product. After all, isn't the word productivity a derivative of "product"?

If we don't have a firm understanding of the system development products, we cannot measure productivity. The development of such products demands the coordinated use of both human and automated resources.

Collectively, these components organize data for decision making and define the information system resource. The most important factor in managing the information system resource is controlling the translation of raw data into information.

Key Attributes

As an integral part of the transformation process, certain key attributes need to be present to convert data into information. These rarely are. Data becomes information when it is presented in an understandable format, in a defined context, with a specified accuracy and in time to make a decision. If the solution to the translation process is simple, why is data an underutilized resource?

The reasons, while not well defined nor universally accepted, can be attributed to the following:

- The mystical cloud of technology surrounding computerization has masked the true data attributes and interrelationships from the users.
- Corporate management has not brought DP into its fold as a central service organization equally responsible to all operational units. This has created unnecessary political barriers inhibiting data sharing and has resulted in redundant information centers.

As previously stated, decisions to expend information resources are only as good as DP's understanding of the system needs. It follows then that unless the responsible management participates in the definition process, data may be presented in the wrong context or with imprecise accuracy resulting in a bad decision.

In many cases the definition process has been relegated to us (DP) without proper management controls. With the rapid changes to computer processing capabilities, only a few operational managers outside of DP have kept informed about computer technology.

This lack of information has been used to shield the DP function from control. Acronyms, buzzwords and technical jargon have confused and further segregated them from the corporate mainstream.

DP personnel have attempted to

force systems design along functional lines based on partial understandings of the information uses.

They have been successful in implementing operational systems with shared data, but never able to provide the flexibility corporate management desired.

Exec Participation

This leads to the second contributing factor, which limits data utilization — need for corporate-level participation. The historical pattern shows DP reporting through a functional manage-

ment organization.

Cross-functional information flow was restricted by existing operational applications. However, DP more often ignored the problem simply because it was politically unwise to deal with it. The functional management reporting obviously encouraged favoritism and thus hampered the attempt to provide shared data usage.

Increasing complexity, accuracy and time constraints being placed on executive decisions have emphasized the need for information dissecting the entire organization rather than data only

used in its functional context.

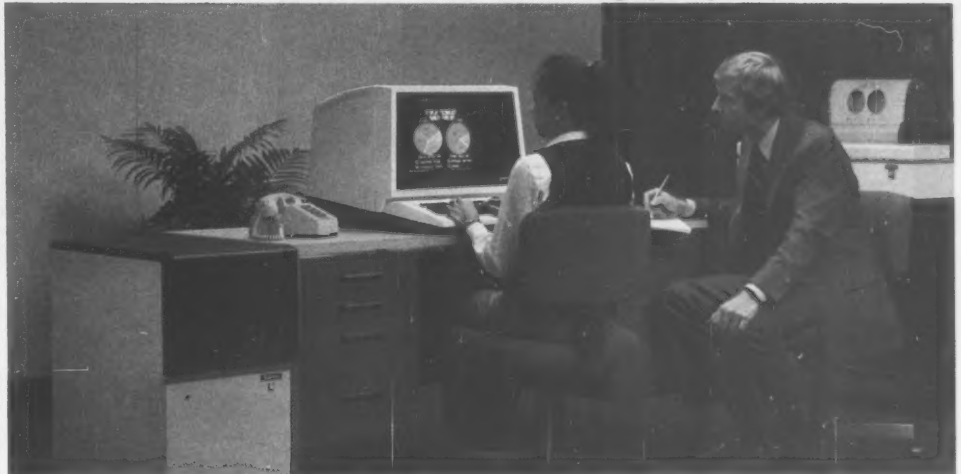
Such ad hoc requests have been the prime force in changing the patterns of information flow and the system design. Recently, the advent of data base management systems (DBMS) has focused corporate management's attention on the effective utilization of proven computer enhancements.

The increased cost and complexity of the data base approach has caused the awakening to data as a valuable resource. Previously, computerized, written and verbal forms of information

(Continued on SR/38)

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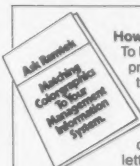
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Burden for Support Staff Reduced Results-Oriented Training Eases Mass Marketing

By Jay Sedlik
And Joel Rakow
Special to CW

The need to efficiently market a small business computer and maintain appropriate customer support has led to the development of a unique solution to increase both employee and customer productivity and allow the mass marketing of that computer for a major Fortune 500 company.

The challenge was to facilitate the process of mass marketing by reducing the heavy burden normally assumed by the manufacturer's customer support personnel in installing and implementing a new, small-scale DP system.

Whereas installation and implementation of large-scale systems may justify the involvement of the manufacturer's customer support organization, similar manpower support for the low-end computer is neither feasible nor cost-effective.

The solution was to develop a series of support materials that customers utilize to organize the installation, operate the system and use the output. The training focuses upon the tasks and procedures necessary to enable customer self-sufficiency while minimizing manufacturer manpower requirements.

The intent was not simply to take a look at the entire process of sales, installation, operation and use of the low-end computer.

Typical involvement of manufacturer and customer personnel was highlighted for each function. Analysis of the model against specific productivity criteria quickly identified critical areas where non-traditional solutions could be applied to lessen the manpower requirements.

A new marketing and installation model was developed and a training system was designed and produced to bring about the achievement of the productivity goals.

Three Audiences

The training solution targeted three primary customer audiences and provided support materials for each.

- Implementors were provided with step-by-step assistance in a printed guide to getting ready for the installation.

- Operators were provided with a complete self-paced training course utilizing an operator guide with a supporting audio cassette tutor, which walked them through each task concurrent with the execution of that task on the terminal.

- An application users guide

Course Title: _____		Number: _____	
Subject Matter Expert Interviewed: _____		Date: _____	
Evaluator: _____		Date Completed: _____	

LEGEND:	
+3	= Performance Based Training -- Very desirable
0	= Part PBT and part Content-centered -- requires improvement
-3	= Content-centered -- will not contribute significantly to customer proficiency.

- COURSE FOCUS**

Course is presented in the context of the customer's business goal.	Course is presented in a context of related information (history or development of topic).
+3 +2 +1 0 -1 -2 -3	
- PERFORMANCE OBJECTIVES**

Objectives establish the skills people need to accomplish the business goal.	Objectives describe the activities that take place during instruction.
+3 +2 +1 0 -1 -2 -3	
- MEDIA SELECTION**

Specific choices of instructional media match the mode in which the actual skill must be performed.	Primary presentation media dominates the instruction regardless of requirements for skill performance.
+3 +2 +1 0 -1 -2 -3	
- SKILL TRANSFER**

Student materials direct the transfer of learning from the instruction to actual job situations.	Key actions to be performed are not isolated and delineated or remain as a listing for reference only.
+3 +2 +1 0 -1 -2 -3	
- TRAINING VALIDATION**

Content and materials are tested on both experienced and inexperienced members of the intended audience, for ease of use, technical accuracy and effectiveness of skill transfer.	Content is evaluated by subject matter experts for technical accuracy and general organization.
+3 +2 +1 0 -1 -2 -3	
- PERFORMANCE IMPLEMENTATION**

Course materials assure that: 1. instruction is conducted effectively, 2. managers and executives are informed and can support the learning 3. skills learned are used on the job to help achieve the business goal.	Course materials address the student only.
+3 +2 +1 0 -1 -2 -3	
- PERFORMANCE EVALUATION**

The success of the course is evaluated on its contribution to the achievement of the business goal.	Success is evaluated by student reactions to the course or by the number of students who enroll.
+3 +2 +1 0 -1 -2 -3	

TOTAL SCORE: _____

Results-Oriented Training Evaluator

highlighted the information available on each of the reports produced by the system.

On the manufacturer's side, guidance was provided to salespeople, customer support personnel and their branch supervisors on how best to implement the customer training solution.

During the sales process, the customer was oriented to the respective roles of manufacturer and customer personnel in the installation, operation and use of the system. Training materials were reviewed and a hotline number was set up to resolve any questions or problems.

Although exact numbers are not available for publication, implementation of this program thus far demonstrates that an order of magnitude reduction in the amount of time of customer support per installation was achieved; customers have been able to install, operate and use the sys-

tem without on-site presence of the manufacturer's sales or support personnel and a minimal number of hotline calls has been received per installation.

Training Criteria

These dramatic results can be directly attributed to the design of a training system that supported the marketing of the low-end computer system. The development of the materials was based on a results-oriented design process that established seven criteria for the training:

- **Systems focus.** The focus of a results-oriented training program is presented in the context of the host organization's business goal.

- **In contrast,** most training programs are presented in the context of what subject matter experts believe trainees should know. In such cases trainees are provided with background information, history or the host organization's overall hopes and expectations.

- **Performance objectives.** Results-oriented training is based on the skills that trainees need to apply on the job in order to succeed. In contrast, most training programs identify objectives that state the activities and content to be covered during the training.

- **Media selection.** Results-oriented instruction incorporates the selective use of specific media to teach specific skills. In contrast, typical training programs employ a particular medium of presentation (film, book, lecture) and this medium conveys the bulk of the training.

- **Skill transfer.** Results-oriented training materials direct the transfer of skills learned during the training experience to actual job situations. Such training materials will use performance aids that direct and inform trainees throughout the complete procedure required for successful job performance. In contrast, typical training programs provide information that the trainee must try to apply to his or her own job situations. Key job actions are not isolated and delineated.

- **Training validation.** Results-oriented training programs are validated against technical experts who can say the program is accurate and complete; successful performers who can say the program teaches the same procedure used by those who perform successfully and naive individuals from the target audience who are able to master

(Continued on SR/38)

Performance Guides Dissolve Productivity Blues

Special to CW
MERRIAM, Kan. — Two years ago, Ted Bair, director of Data Processing for Adventist Health System/Eastern & Middle America, was dissatisfied with employee performance and productivity. He also saw a number of warning symptoms that indicated employees and supervisors were not happy with the situation either. That is when Bair put his finger on what had been a pervasive but nebulous problem: Jobs and performance standards had never been developed or used consistently.

"The problem was easy to define," Bair said, "but developing objective criteria has been difficult. I think we have made a good start. Supervision is certainly more efficient and fair. Employee morale has improved. When we finally committed standards to paper, everyone agreed with them."

When Bair began developing standards two years ago, he headed a conventional hospital DP department. The director believes that one or more of the danger signals he spotted in his own organization is likely to be present in almost any data processing department which has not developed standards. According to Bair, employees sometimes have no firm grasp of what is expected of them. They do not accept full responsibility for assignments, fail to cooperate fully with co-workers and do not recognize the impact of their work on others. One result is that many jobs reach 90% completion, but few are ever 100% complete.

Circle of Frustration

Supervisors are frustrated because they feel subordinates do not understand quality or quantity job requirements, Bair claimed. They are disgruntled because they feel employees do not recognize priorities and concentrate on trivial job duties while neglecting important ones. Supervisors' vague dissatisfactions with employee performance are not communicated to employees in a positive manner, which could give them goals.

Individuals and/or the department is not carrying out functions aggressively. As a result, there is upper management pressure for improvement. Upper management's dissatisfaction feeds DP management dissatisfaction and is conveyed to employees as annoyance.

The marks employees receive in performance reviews shift dramatically when supervisors change, even though the employee is doing his or her job in the same way, Bair said. When good or bad employees leave, managers often discover that the employees' reputations were not deserved. This indicates that an employee's evaluation is based on a supervisor's impression of job performance rather than fact.

There are few, if any, department employees qualified to move into management slots when they become vacant, he added. In some cases, no one in the department is qualified for any type of promotion.

Bair believes the presence of any one of these symptoms confirms a need for objective job-performance standards. Though he thinks job standards should be created for every DP posi-

tion, he so far has written criteria only for the three group programming positions: junior programmer, programmer and programmer/analyst.

Job Descriptions

For each of the three programming positions, basic job descriptions first were written. A junior programmer, for example, now is defined as an "individual who usually works on one item at a time under supervision. Any work produced is checked before implementation. The candidate must already be a programmer with one year active experience in programming."

The specific meaning of such job de-

scriptions were spelled out in "Job Knowledge" and "Quality" expectation sections. Different job knowledge and quality criteria have been designed and written as nine career building blocks within programming.

Thus a junior programmer must go through three steps in that position before qualifying for the first job step in the programmer category. A new programmer, in turn, progresses through three steps before he or she is considered for a programmer/analyst step-one position. There are three career steps for individuals at the programmer/analyst career stage, too. Each job step is pegged to salary hikes.

Bair said that in his operation, a step-one programmer must have acquired a given set of job skills or knowledge and be able to use direct file access and index sequential file methods.

He or she must also master vendor utility routines and be able to program in at least two appropriate languages. The programmer must work on at least three single program objects simultaneously. To test programs unassisted, the person must be able to correctly set up all files and control string instructions for single-program tests, prepare test data and analyze results using file prints.

(Continued on SR/40)

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Marketing Eased by Results-Oriented Training

(Continued from SR/36)

the program's objectives in a developmental test. Typically, training programs will be validated only by subject matter experts for the accuracy of the content and for general organization.

• **Performance implementation.** Results-oriented training programs ensure that the training is conducted effectively by the training administrator or facilitator. In addition, such programs address two levels of management above the training audience: (1) First-line supervisors are oriented to the training, provided with specific measures by which to monitor a trainee's application of skills and given

specific direction in how to work with and support a trainee's progress; (2) Managers of those supervisors are also oriented to the training and informed that their subordinates are working with the trainees on the implementation of the skills. Key issues are identified which the executive might discuss with the supervisor. Typical training program environments address only the trainees and not the supervisory and management environments.

• **Performance Evaluation.** Results-oriented training is evaluated by actual attainment of the business goal. The evaluation of the training will be conducted by the manager or executive as

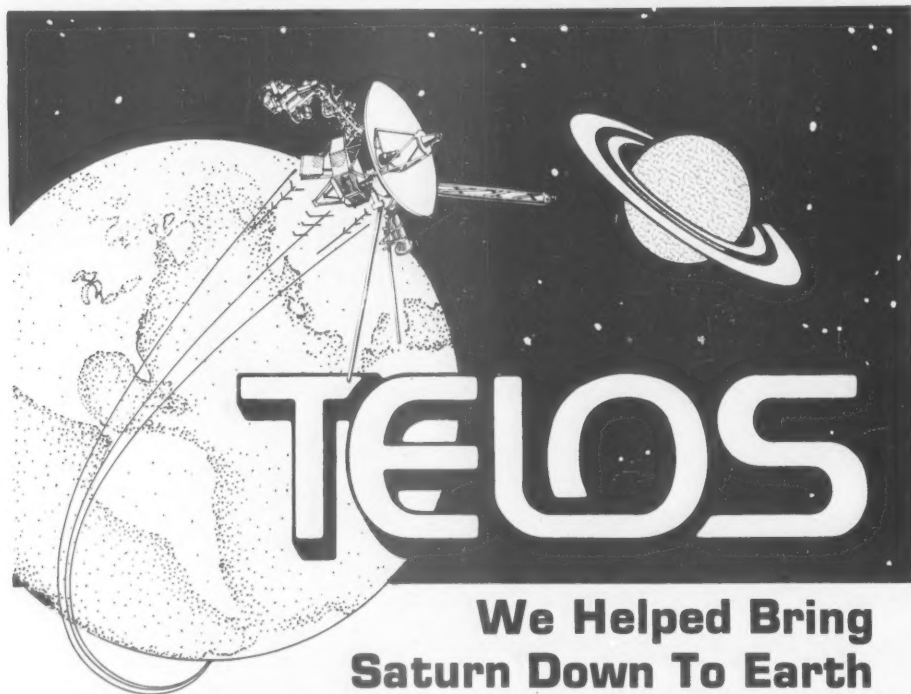
part of the implementation discussed above. Typical training programs are evaluated either by trainee reactions to the course or by training administration according to the total number of enrolled trainees.

It focuses attention on performance implications of business goals. It suggests that programs that are designed to solve a business need have performance objectives based on what people have to do to achieve business goals related to those needs and are structured to support performance both within the training and on the job have a greater likelihood to positively impact productivity.

A results-oriented training program will score no less than +20. However, typical training programs, even if evaluated by a biased judge, will score only between -6 and +10. The difference between these scores represents a significant difference in potential results.

As demonstrated by the results of this program, significant increase in productivity can occur with the application of the results-oriented approach to training. Traditional training approaches to similar performance issues should be thoroughly evaluated against a results-oriented training approach if these increases in productivity are to be achieved.

Sedlik is executive vice-president and Joel Rakow is manager of industrial design and development for National Training Systems, Inc., Marina del Rey, Calif.



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Accent Should Be on 'Product'

(Continued from SR/33)

tion flow were less easily quantified since accuracy and precision were not well defined.

Therefore, any lapse in current data was covered by using archaic data. Rarely was this evident. The centralization of data exposes the risk of data lapses and forces economization of the resource through corporate control.

Do not mistakenly conclude that purchasing a DBMS solves all problems. It is the management involvement and control that is required for success of a project and the magnitude, cost and risk of a corporate data base.

Once controls are applied, increased management reliance on the data will assure continued integrity. Additionally, line operations will be improved as their functional data is instantaneously shared. The reduction in wanted resummation, transportation and so on of the data alone can justify the capital expenditure required for the DBMS software.

In conclusion, corporate management needs a pool of readily available information which is properly structured and maintained to known accuracy to serve as a base for its ad hoc (what-if?) decision process.

To achieve this goal, corporate management must place some degree of personal concern and involvement in the data to information design. Without this personal concern, the organization of data and level of control is probably going to be inadequate.

More importantly, the proper organizational structure and management reporting will never be effected without continuing direction from corporate management.

When we, as managers, consultants and DP planners, recognize that an informed and active management can have an important effect on the company's productivity, half of our responsibility will have been fulfilled. The other half, of course, is following through with the management educational process and project control of the approved projects.

Moss is vice-president of DBD Systems, Inc., Austin, Texas.

In Clerical, Technical Functions Office Model Spots Productivity Weak Points

Special to CW

BOSTON — A time-sharing service office model is measuring the productivity of 40 underwriting field offices of Commercial Union (CU) Insurance Companies.

The model produces a productivity index for each office based upon performance of almost 100 functions for six processes and 14 lines of business.

"Before implementing the new model, it was impossible to measure cost, time and performance of all these variables," Donald H. Thimas, assistant vice-president of CU Commercial Lines, Inc., said.

The model has several management uses. It identifies nonproductive time in both clerical and technical operations. It can also be used to assess the impact of future growth and increased automation within the company.

The model results from a 1979 study to plan for extensive automation of commercial lines (business insurance) underwriting at CU. Manual methods proved inadequate to define the scope of current operations. "Before automating commercial lines, we needed a clear and complete picture of current operations. The service office model makes this possible," Charles J. Purrelli, president of the CU Automation Services, Inc. subsidiary, said.

Bremer Associates, Inc., a Boston-based DP management consulting firm, designed and implemented the model and participated in the 1979 study.

Field Office Study

Although based in Boston, CU has the majority of its commercial lines policies underwritten, rated and issued from more than 40 field-service offices. An examination of the procedures, functions and staffing of these offices was the starting point of the study.

Survey teams were sent to six typical offices with these goals:

- Identify each work function and the employee group responsible.
- Quantify the time and cost of each function.
- Correlate all functions and lines of business.
- Evaluate the automation potential of each function.

The teams consisted of management consultants from Bremer Associates, corporate management information systems (MIS) analysts and Commercial Lines systems analysts.

The result of the field survey could not be adequately scrutinized or evaluated by manual methods because of the large quantity of facts accumulated by the team and the complexity of the interrelationships of work functions.

A computer system was developed to provide useful statistics from the amassed data. As a result, management recognized that a formal system for modeling its service office operation would be an invaluable information resource for monitoring productivity and costs and quantifying the processes most desirable for automation.

The model served its original purpose by providing information for the net-work planning phase of the automated

CU Commercial Policy Service System. It aided in determining the number of video terminals and printers to be installed in each of the 45 field-service offices by examining the characteristics and quantities of work performed manually.

Information from the model also assisted in identifying the revised personnel requirements of these offices resulting from the installation of the CPS system.

Currently, the model's primary usage is in productivity measurement, but additionally, the model identifies non-

productive time in both technical and clerical operations and is being used to assess the impact of future business growth and of further automation of work functions.

The model was conceived as a user-oriented, user-controlled management information resource. Once installed, no further programming or systems intervention is required.

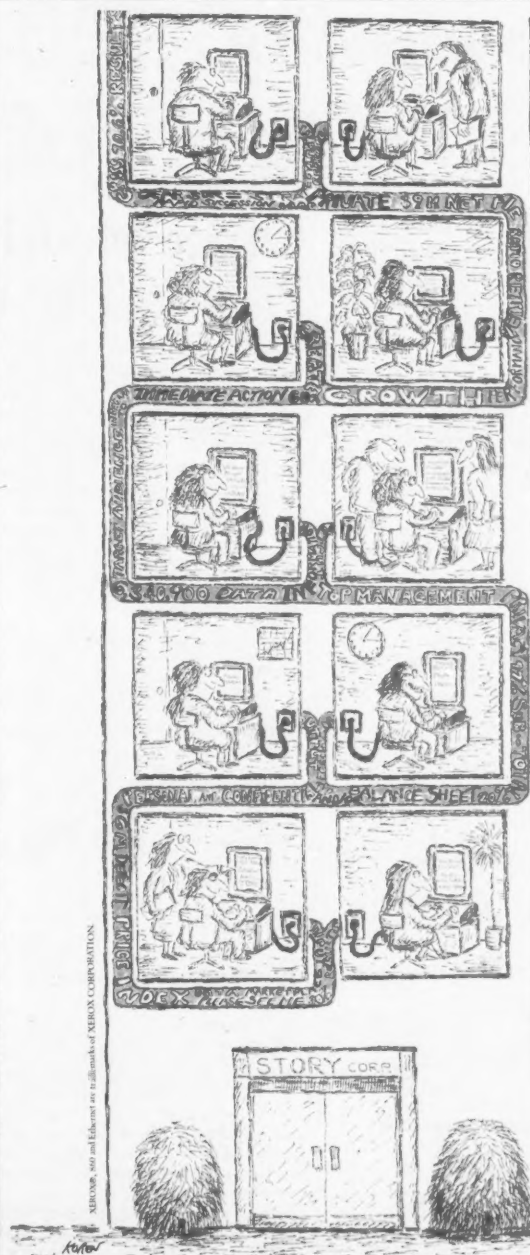
Contributing to this independence is the use of the Ramis relational data base management system, Ramis report syntax and Bremer-developed interactive executive procedures.

"We used the Ramis data base management system for the model because of its flexibility and CU's familiarity with it," John P. Bremer, president of the firm, said.

Bremer said the interactive executive procedures rigidly control the standard functions of the model in: data entry, data edit, detail file creation and update, summary file creation and update and standard report processing.

In addition, the procedures allow model management complete flexibility to choose the functions, positions,

(Continued on SR/40)



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Collect Best Techniques

Three Ts Key to Maintenance Productivity...

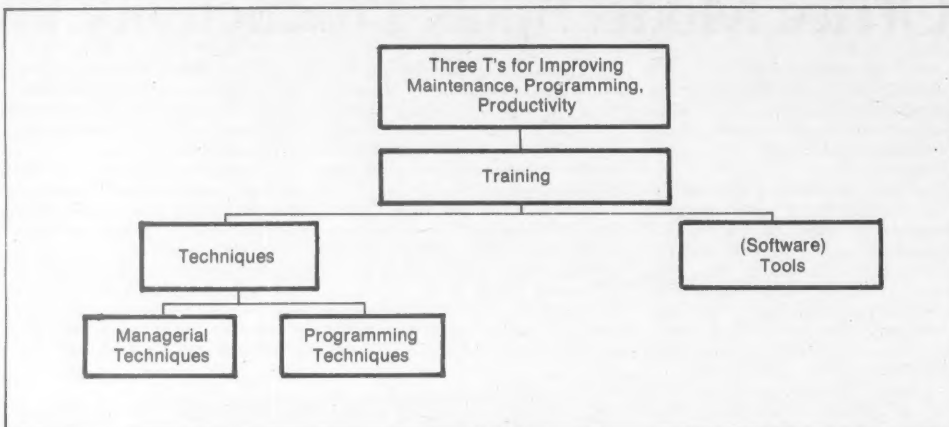
By Girish Parikh
Special to CW

The key to improving maintenance programming productivity is in the three Ts: techniques, tools and training (see figure). Before the three Ts can be effective, management should recognize that maintenance work is a respectable function, no less than the development function. Maintenance programming is challenging and the personnel doing such work should be rewarded when appropriate.

The productivity techniques (the first of the three Ts) are not only for technicians, but also include management techniques such as developing standards and guidelines, organizing the maintenance function, evaluating a maintenance programmer and so on.

In the company standards manuals, there is usually very little material on maintenance. However, guidelines can be developed to help maintenance programmers. The following are suggestions for developing guidelines to improve maintenance programming productivity.

- Collect the best techniques from all departments or programmers doing maintenance. This will involve talking with successful maintenance program-



The Three Ts

mers about their methods. This may not be an easy task. But if a super maintenance programmer is motivated to reveal his techniques, a lot can be learned about the craft of maintenance.

- Study how much each of the following factors contribute to effective maintenance: job knowledge, knowl-

edge of the language in which a program is written, existing documentation of the system/program, experience in maintenance, logical thinking and positive mental attitude.

Such a study can indicate what kind of training, if feasible, may be set up to make the maintenance activity more productive.

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Office Model Picks Out Productivity Weak Points

(Continued from SR/39)

offices and lines of business to be measured; on-line or batch processing; and the use of ad hoc or cataloged report programs.

CU Insurance Companies is currently producing reports and graphs for management review and analysis, detailing productivity for each employee group within each office and for each office within a region. Other reports compare the productivity between offices and between similar groups in different offices.

Support Essential

Gaining acceptance of the productivity model by the service office managers was essential. Training sessions with all 40 managers reviewing the

background, purpose and assumptions of the model preceded their analysis of the model reports for their individual offices. Emphasis was placed on confirming the accuracy of the work functions, lines of business, work groups and standard times and normalizers.

At present, 1980 data is being processed to provide management with current productivity results. As familiarity with and confidence in the model grows, data for shorter, more current time frames will be produced.

Concurrently, business growth projections are processed by the model to estimate personnel needs — clerical and technical — for the next five years.

Separately, the effect of automating additional work processes is being analyzed with the aid of the model.

Performance Guides Clear Employee Productivity Blues

(Continued from SR/37)

The programmer also must know how to use vendor number systems, table logic in programming, overlay processing and vendor publications.

Acceptable Performance

From a quality perspective, step-one programmers are performing their jobs acceptably when they can manipulate files without detriment to production or test runs. They must also be able to obtain and use file prints and directories competently and analyze single-program test results without assistance.

To gain a promotion to the programmer step-two slot, the level-one programmer must learn how to use unlabeled tape files and be able to patch

areas within a program, if this is a site-approved procedure, Bair said.

The person also must be able to manage projects having two or more related programs and demonstrate mastery of the vendor dating scheme for file management. Of course, there are associated quality standards for this increased set of job skills, Blair added.

"One overlooked advantage of job performance standards is the impact on supervision," Bair said. "Standards can help supervisors increase their efficiency while learning to be better managers. Since many DP supervisors haven't received management training, standards can be a valuable aid in helping new supervisors understand what is required of them in their new roles."

Study Training Possibilities

...If Management Respects Programmers

gramming facilities and/or use software packages to aid programmers, develop shortcuts to help improve the maintenance programming productivity. Document often-used features of the software aids with examples and building tips applicable to the environment. Also, look into other easier to use software packages to aid programmers.

Other areas of concern include:

- How night calls can be handled effectively. List phone numbers to call if needed. (More importantly, determine how to prevent night calls.)
- How to improve on existing documentation. Making improvement or developing documentation as a by-product of regular assignment.
- How to estimate the time required for a maintenance assignment. How to measure maintenance productivity. (Does technical knowledge of the first line manager help?)
- Creating test data and testing methods. Building job control language test streams.
- Start maintenance tips/techniques/guidelines columns in the in-house technical newsletter, if published, (if not, it may be started) containing brief descriptions of how problems were solved.
- Use structured disciplines in maintenance when possible. Team operation, walk-through and librarian can be helpful.
- Better maintenance may provide job satisfaction to some extent, reducing the turnover indirectly.

'Tools' for Maintenance

Get software tools that aid maintenance. We try to do certain functions manually, reinventing the wheel every time, even when software tools are available.

For example, to compare two output

files, we often take dumps or print them and painfully compare them when file-compare utilities are available. There are several good tools available, such as source library systems, on-line programming systems (like TSO/SPF), test data generators, reformatters and so forth. Most of the tools are useful in maintenance, as well as in development.

One midwest company, the Catalyst Corp. of LaGrange, Ill., is currently testing a Cobol Structuring Engine that automatically restructures the unstructured Cobol programs along with

structured retrofit concepts. The restructuring and retrofit service have just been available.

Most of the DP training is focused on the front-end work of development — 33% of the system life cycle. Proper training in the remaining 67% of the software life cycle (that is, software maintenance) can pay rich dividends. Maintenance programming productivity can be improved by appropriate training programs.

It seems that, by default, on-the-job training is the way of training maintenance programmers in most organiza-

tions. It is a slow process, involving trial and error. Sometimes a programmer never learns the right way of doing things. Bad habits formed are hard to remove. Also a programmer may imitate the senior programmer or the boss, picking up bad habits along with good practices.

Thus, a productive maintenance environment can be created by the effective use of the three Ts: techniques, tools and training.

Parikh is a Chicago-based consultant specializing in software maintenance and structured technologies.

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User Acceptance Plan Keeps Productivity High

By Peter B. Wilson

Special to CW

For a software project to be successful, the users must be satisfied. Too often a project is judged a failure because of a gap between what a user expects and the system that is delivered, even if the software is technically sound.

This gap often reduces over-

'If users are not committed to the system early in the project, that commitment may not develop later. Serious consideration should be given to delaying system design until the user is able to devote adequate resources to the project.'

all productivity because additional resources are required to modify the system and gain

user acceptance. Applied Information Development (AID) has sought to develop

techniques to minimize this problem. One very successful technique has been AID's user acceptance methodology, which has evolved into a cost-effective technique to ensure user satisfaction and thus improve the productivity of the development process.

The methodology is based on the concept that software

changes are exponentially more expensive to effect as a project advances through its life cycle. Thus, to be effective, any user acceptance technique must be designed to identify software errors (requirements, design and coding) as early as possible.

Since most system errors are introduced during the requirements definition stage of a project, significant productivity improvements can be made if the errors can be caught early in the life cycle.

One user acceptance technique used by most companies is the "user sign-off." Although it is occasionally effective, there are often problems:

- System specification documents are typically neither tutorial nor user-oriented. Unless the user is already very familiar with the details of the new system, he will frequently be required to sign off on the system without adequately understanding its nature and details.

- System specification documents are frequently incomplete. While the user may understand and sign off on what he reads, potential problem areas may not be discovered, because they were not included in the specifications. It is difficult for anyone reading a technical document to follow the material and, at the same time, identify missing areas.

- The user may simply not understand what the requirements of the new system should be.

These problems and others usually manifest themselves in the following ways when the system is installed:

- The user does not feel the new system is any better than the system it replaced.

- The user requests significant changes to the system.

- The user has difficulty operating the system and requires significant assistance from the system development staff.

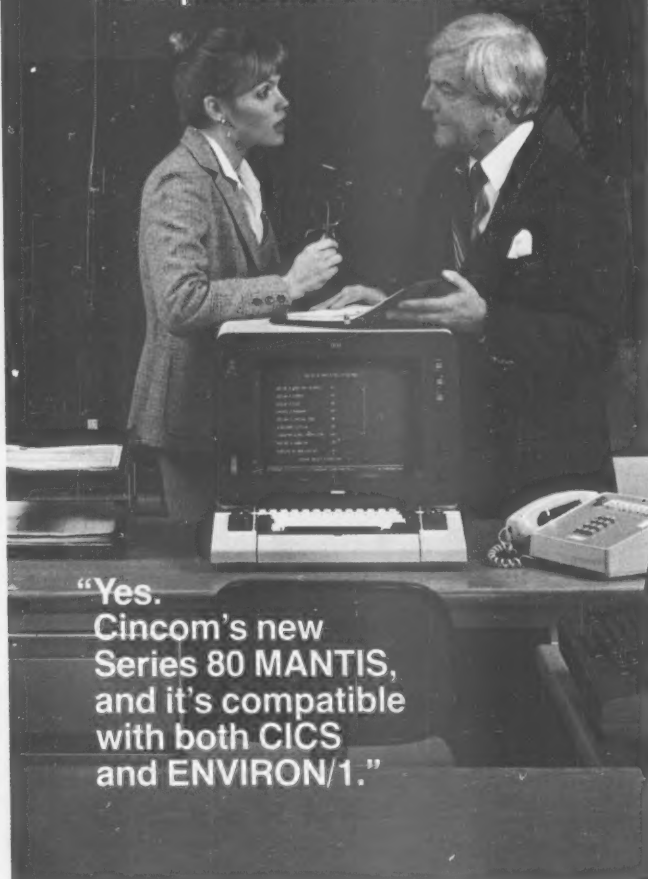
All of this requires extensive effort and reduces the overall productivity of the development process.

Active User Role

AID's user acceptance methodology attempts to minimize these problems by requiring active and specific user involvement throughout the project life cycle. Specifically, users are required to develop a detailed acceptance test plan during the system design phase which becomes the sole basis for user acceptance. The acceptance test plan must be based upon the requirements specification and must include detailed test cases with expected results.

This approach has a number (Continued on SR/44)

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Using Mini to Back Decision Making Investment Firm Collects Productivity Dividends

CHICAGO — An investment management company here recently decided to make an investment for itself — and it's paying off in increased productivity.

The Lincoln National Investment Management Co. (LNIMC) has installed a mini-computer system to aid its investment business, and productivity has increased impressively, according to Richard Steck, vice-president.

LNIMC is the investment management affiliate of Lincoln National Corp. (LNC) and is responsible for providing investment management services to LNC, its affiliated companies and to the clients of those companies.

LNIMC has a fairly traditional organization structure built around security analysts, portfolio managers and a supporting clerical staff that assists in gathering investment information and preparing analytical reports. But the company has implemented a number of changes that set it apart from many other firms in its field.

Deluge of Data

Attempts to quantify the investment decision-making process have not limited the amount of data facing the investment decision maker. The decision-making process is still unclear and the "art vs. science" dilemma of investing may never be resolved, according to Steck.

Investment decision makers have traditionally scrutinized vast amounts of data, extracted information, tempered that information with judgment, made decisions and hoped that in the end, superior investment results would

be achieved. Repeating the process for a large universe of stocks magnifies the labor without proportionally improving the results.

An active LNC internal quality commitment program required a lot of labor-intensive work, even in areas as seemingly unstructured as investment decision making, Steck said.

Mix of Old, New

To facilitate performance practices, Steck decided he needed to mix old and new investment techniques. "We wanted processes to effectively convert data into information. We began with the assumption that data worth storing and retrieving was worth storing in a computer data base."

He rejected commercial time-sharing as a serious source of investment information "because it is invariably the most expensive approach. Just when you begin to discover the amount of work you can accomplish on a time-sharing service, the bills begin to arrive and discourage exploratory use of the data," he said.

The use of large-scale in-house computing facilities raised the recurring questions of computing access and priority. Investigative use of computers tends to get the lowest priority. In-house DP people are more responsive to users (such as accountants) who are capable of articulating their needs down to the formats of specific reports required, according to Steck.

"If in-house computers could have helped by now, they would have. So for our purposes, we rejected the use of in-house computing," he

said.

Management made some educated guesses as to the type and amount of hardware needed, spoke to several vendors and selected a Hewlett-Packard Co. HP 3000 mini-computer, a multiuser system with mass storage capabilities, a data base (Image) and inquiry (Query) software.

"I have no doubt that other computer hardware also could have satisfied us, but HP had a fairly respectable reputation and I wanted this project to succeed with a high degree of certainty," Steck said.

The investment firm's staff members designed their own data bases and were encouraged to include any data elements they thought might be useful, since the cost of storing data on mass storage equipment is relatively small, Steck observed.

Building Data Base

Parts of the data bases were loaded from commercially available sources. Other parts were filled with the analysts' estimates and opinions. The company is also beginning to store analysts' written reports in the computer for retrieval on demand rather than as circulated typewritten reports.

Steck is also encouraging the brokerage community that used to supply LNIMC with tons of paper to try to begin supplying some future information in magnetic tape form.

Through desktop CRT terminals, the staff can rapidly access investment data and manipulate it into formats helpful for decision-making. Rather than explain their needs (which change from company to company and from day to day) to a "computer guru," staffers now use canned inquiry software to write their own reports, the vice-president explained.

"Place a powerful and easy-to-use computer in the midst of a group of bright investment professionals and you can't stop the productivity improvement that begins to occur," Steck asserted. "We are now able to monitor our own stock universe in a nearly real-time sense and to react as soon as price or fundamental factors trigger project parameters."

Research attention can now be concentrated in companies and industries requiring such attention, the firm has found.

Dividend Discount Models

In addition to data base activities, the firm has also developed conventional dividend discount models and made them available on an in-

teractive basis so that a decision maker sitting at a terminal can manipulate his inputs to evaluate stocks under a variety of assumptions. If he doesn't want to vary his assumptions, the system will do it for him.

Another area of productivity improvement is short-term investment management, according to Steck. LNIMC manages more than \$80 million of its short-term funds

with a program written using Image and Query. The program was written in about a month by someone who was just learning these software products, Steck claimed.

"I've seen more change in our own investment landscape in the last six months than I have in the last 10 years," he commented. "Automation has significantly impacted the way the LNC family conducts its investment business."

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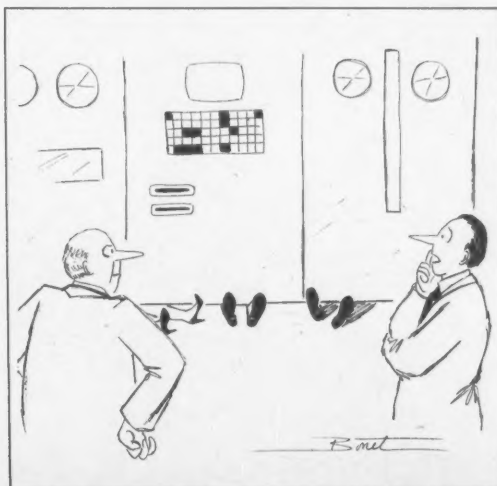
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Productivity Buoyed by User Acceptance Plan

(Continued from SR/42)
of advantages:

- Since the user is involved early in the project and with specific tasks and deliverables, potential problem areas in the requirements specification are pinpointed and corrected much earlier than would otherwise be possible
- Because the user is re-

quired to develop detailed test cases, he becomes very familiar with the system operation and, in effect, is trained on the system early in the development cycle. This facilitates the entire installation process.

- The user is not being asked to do more than would normally be required, only to do it earlier.

'Since most system errors are introduced during the requirements definition stage of a project, significant productivity improvements can be made if the errors can be caught early in the life cycle.'

It should be emphasized that the acceptance test plan is not a substitute for a detailed inte-

gration test plan. Since the integration test plan is developed by the software develop-

ment team, the emphasis will be to find flaws in the software. The acceptance test plan is developed by users, so the emphasis will be to find flaws in requirements, procedures, human factors and so on.

This difference in perspective, if properly exploited, can be used to pinpoint numerous problems before they grow to major proportions. The problems may not otherwise be visible until the system is in operation, at which point changes are enormously expensive.

While this approach to acceptance has been used successfully on many projects, most objections to it fall into two categories:

- There is not enough information in the requirements specification to develop a test plan.
- The user does not have sufficient resources to devote to the new system.

The first objection may be valid. If so, it indicates a problem with the system requirements documentation. The system should not proceed into design until the requirements have been adequately defined.

The second objection is frequently a specter of things to come. If users are not committed to the system early in the project, that commitment may not develop later. Serious consideration should be given to delaying system design until the user is able to devote adequate resources to the project.

In summary, a carefully planned user acceptance methodology, such as the AID methodology outlined above, can successfully minimize the gap between the system a user expects and the one that is delivered. This results in fewer software errors and significant improvements in productivity.

Wilson is managing consultant, Quality Assurance and Business Systems, at AID, Oak Brook, Ill.

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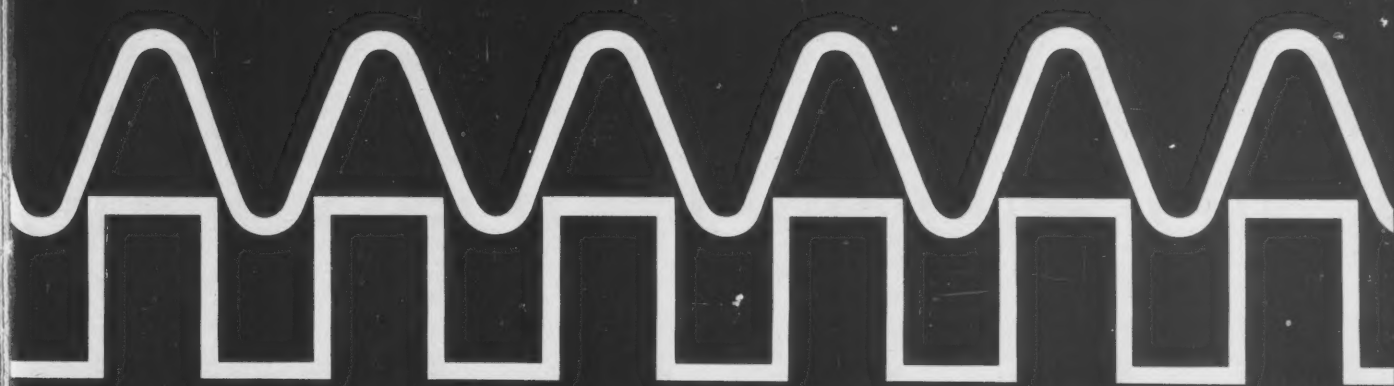
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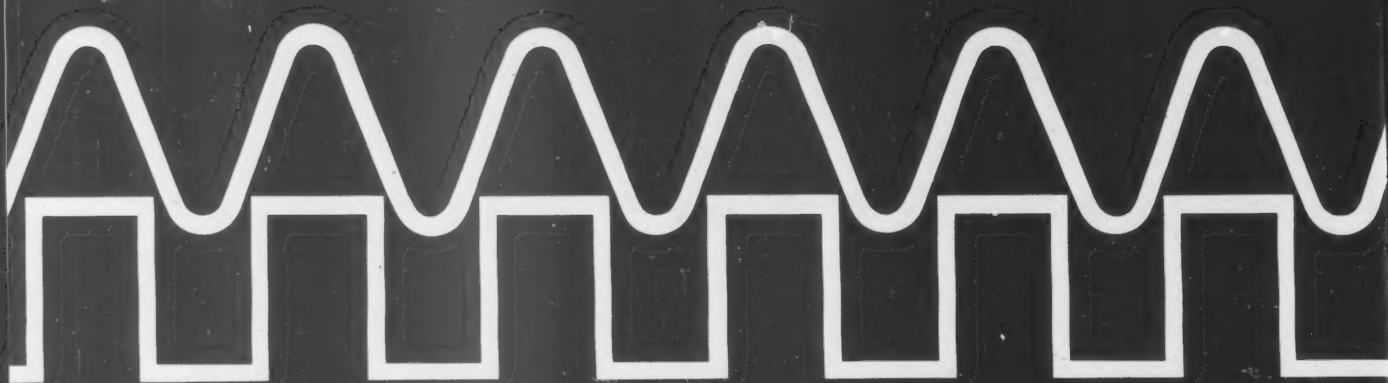
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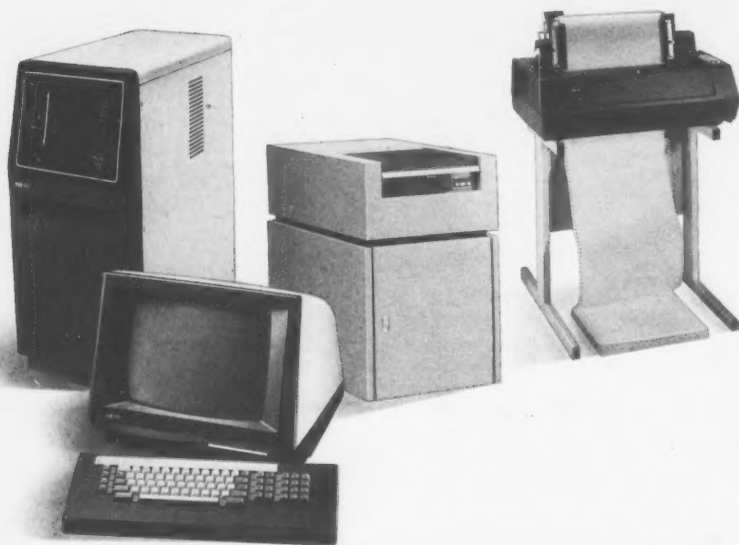
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Better Skills and Tools, Not Just Investment,

By Craig D. Divino
Special to CW

An analysis of current trends in electronics manufacturing indicates an increasing burden will be placed upon DP to support the needs of manufacturing management as it responds to current challenges to increase productivity. Manufacturing operations management in the electronics industry must improve the skills and tools necessary to cope with an environment of a rapidly changing technological base, rapid growth and product complexity.

DP must evolve to support more sophisticated manufacturing technologies, alternatives in manufacturing automation and enhanced data collection, processing and feedback.

All too often in making productivity-related manufacturing decisions, operations management views DP as a purely technological resource comprised of complex machinery or sophisticated software. In many cases, this attitude may compound existing inefficiencies by adding to the systems implementation backlog.

Assessing Resources

The appropriate response to additional requirements is to realize that DP operations are analogous to any other manufacturing production area. The knee-jerk response of procurement must be replaced by a review of existing DP facilities for productivity improvement.

• **Forecasting.** Planning the future in the DP environment is no less important than planning the future in manufacturing. The forecast becomes the primary building block in the establishment of a foundation for adequate production scheduling.

The forecast must include all known normal production requirements for daily, weekly and monthly processing. Allowances must also be made for such known periodic large jobs as materials resource planning (MRP), standard cost maintenance, bill of material updates and extracts and physical inventories.

Included in the forecast must be system development time—the most difficult element to forecast. In a dynamic manufacturing environment, priorities for system development change on an ongoing basis.

It is imperative that realistic expectations for this area be included in the annual forecast of DP requirements.

The forecast horizon is determined by the ability to predict existing systems development demands and to meld

that prediction with a realistic forecast of new high-priority projects that are expected to occur within that horizon.

• **Capacity Planning:** Rough-cut capacity planning simply takes all forecasted requirements and calculates resources required to satisfy them without taking into consideration such practical limitations as machine availability or programming resources.

After this rough-cut plan is complete, these considerations must be integrated, along with priorities and other subjective considerations, in completing a firm capacity plan.

• **Manpower Planning:** It must be understood that a

substantial portion of DP resources consists of technical manpower.

Associated costs constitute the largest element of a DP budget, therefore, increasing labor productivity will realize the largest return on investment.

In managing the DP labor force, production control is of

primary importance. Master production scheduling is a concept successfully used in manufacturing operations; it can be successfully applied to operations as well.

Master Schedule

The master schedule identifies the specific production expectations to meet DP com-

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mitments for a specific time period.

Therefore, DP operations must be responsible for meeting the production schedule or explaining deviations from it.

Project accounting is another scheduling concept that can provide either manual or automated control over systems development effort and pro-

vide timely feedback regarding progress toward specific milestones. Deviations from the project schedule must be reconciled on a regular basis to maintain overall project control.

All daily DP activities should be planned to ensure that a proper focus is maintained. "To-Do" lists, with target

dates and assigned individuals, provide a vehicle for this control and serve to make job performance more goal-oriented.

• **General Production Control Principles:** Several principles used in manufacturing production control can be of great benefit when applied to DP.

The lead time required before a change can be made to the DP production schedule is finite. By time-fencing the specific response time required to add or change normally scheduled jobs, appropriate controls to support the new or changed jobs can be installed.

Understanding this reaction

time can avoid the rerunning of jobs.

If processing time is a constraint in a particular operating environment — as it frequently is — a manager will realize benefits in time from expending the effort to maintain adequate documentation, well-defined schedules and detailed data control procedures.

When planning capacity, production scheduling must take into account holidays and vacations, especially for major jobs that must, as defined in the requirements forecast, run periodically during the year.

Staffing should be maintained at a level necessary for normal production level, with specific responsibilities assigned.

With careful utilization of overtime and outside services, control at an efficient staffing level and continued response to the cyclical demands placed upon DP by the user community can be maintained.

Pareto's Law

Pareto's law (the rule of 80/20) states that 80% of the benefit associated with any task or project is achieved through an expenditure of only 20% of the effort required to accomplish the total task. This law is applied extensively in materials planning and production control and can also apply in DP.

A review of current output requirements will, in most cases, reveal that a reduction of up to 30% or more is possible with no significant loss to the user. If Pareto's law is applied to systems development, it becomes apparent that a majority of the benefits from any new system can be achieved through an expenditure of only a fraction of the effort required to complete 100% development and implementation.

The use of phased implementation will avoid the allocation of all DP resources to one major new system by breaking development and implementation into smaller, semi-independent phases. This approach, combined with the 80/20 philosophy, will allow the DP department to provide more users the support they need on a timely basis.

The discussion above presents only the most summary level review of DP as a manufacturing activity. Many elements in the discussion should be analyzed in much greater detail, and opportunities for increasing productivity should be much more carefully reviewed.

Divino is a manager with Pittiglio, Rabin, Todd & McGrath, Boston.

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Logical Approach Solves Productivity Puzzle

By Steve Beeman

Special to CW

Productivity is becoming a buzzword in the programming field. The surprising thing is how little effort has gone into understanding what makes individual programmers productive and what makes groups of programmers productive or unproductive.

That technically oriented people would look for a hardware or software solution to any problem is natural. This is where our expertise is strongest and where we have seen solutions originate in the past.

However, there may be help coming from another direction. Suppose that

each of us were to approach the problem logically. Where do we start? Where can we find data to help us understand what makes people productive or unproductive?

One very large store of data is available to each of us in our own experience. I seem to have been most productive when I had good tools to work with, was skilled in the use of my tools, felt the people around me appreciated my work and when I valued the end product of my efforts.

I had the most difficulty being productive when I couldn't get adequate computer resources, was unfamiliar with the hardware or software I was

using, when my boss and coworkers showed a definite disinterest in what I was doing and when I questioned the usefulness of my product to my company and society at large.

Problems of Logistics

The first two elements are logistics problems. Just apply the necessary resources of money and time in a logical manner. The last two elements (feeling appreciated and believing that what I'm doing is worthwhile) took much longer to figure out. Fortunately, I'm similar enough to other people to recognize some parts of myself in objective analyses of why people in general

work.

There are some very striking parallels to the elements of productivity in Abraham Maslow's "hierarchy of needs," which he used as the foundation for his motivation theory. Briefly, he listed physiological needs (hunger, and so on); safety (security); belongingness (acceptance, love); self-esteem and self-actualization (idealistic fulfillment).

For computer programmers, the first two needs are easily met. Just read the last third of *Computerworld*. Belongingness? To what? It has been widely reported that programmers have a greater allegiance to their profession than to the company they happen to be working for.

It seems our identity generally gets more reinforcement from being a computer programmer than from being an employee of a particular company. Research has shown that employee attitudes toward their company is largely determined by relationships with supervisors for the first six months with the company.

In order for someone to feel they belong, there has to be acceptance on the other end. How does a supervisor accept, say, the perpetrator of a really big screw-up? This is when acceptance is needed most.

Money Motivator

Money is a strong motivator. Money can be used to gratify physiological needs and is synonymous with financial security. However, let's not forget we're talking about computer programmers who could get a minimum 10% raise by picking up the phone.

It might take awhile to be completely accepted in a new company, but look at all the self-esteem a person could buy with extra money. That's backwards. Look how much more successful a person feels as a result of getting a bigger salary.

Many of a programmer's needs can be met by a larger and larger salary. (Somehow the *change* in salary becomes the basis for an improvement in self-worth as well as recognition.) But let's not lose sight of our objective.

After programmers have been hired and somehow made to feel part of a group effort, we want to motivate them to optimize their productivity. There remains one of Maslow's purported motivating needs that has not been examined here yet.

Self-actualization, as it might manifest itself in a programming environment, could be what motivates programmers to devote all waking hours to that personal project. Some powerful motivators have to be at work here. It may not be worth the price in burn-outs, but when it works, it works very well.

To believe in what you're doing and feel you're making a valuable contribution is an extremely fulfilling experience. Having once experienced this kind of satisfaction, people are motivated to do it some more.

In the 20 years that have seen CPUs shrink from the size of several refrigerators to the size of a programmer's finger, there have been some advances in the field of psychology. There are exercises that can be used to teach su-

(Continued on SR/52)



IT IS
BETTER
TO LIGHT
ONE CANDLE
THAN TO
CURSE
THE
DARKNESS."

Some present-day DP Managers still haven't seen the light. They bemoan the shortage of good technical people, the virtual impossibility of recruiting already qualified personnel, and the low degree of productivity of their existing staff.

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Productivity Success Guaranteed 'RO Method' Tailored to Fit Programmer Needs

By K. Toth
Special to CW

With the birth of the computer, a new labor segment of the society developed — the programmer, an intellectual laborer. Never before in human history has there been a situation where such a large segment of the population earns its living by pure mental work.

Other older occupations involve a certain degree of intellectual work. An engineer spends some of his time with innovative design work. A doctor may get an unusual case which requires superior mental performance to cure the patient. Yet, there is no profession like programming which requires full-time intellectual work.

The genre of the programmer is subject to many criticisms, mainly for "low" productivity, which remains rather steady despite advances in computer technology.

RO Method

The RO method, developed by myself, increases productivity. The method can be used by both management and the programmer. If it is implemented by management, it will raise the productivity of the DP department in general. If it is used by an individual programmer, it guarantees personal success.

RO stands for "results-oriented." The method starts at 9 a.m. with planning the tasks for that day. On a piece of paper you put down five tasks which will become results by 5 p.m. Your daily task list might look something like this:

- Add the change logic to program OC120.
- Change the screen display in the account update program to conform with current specs.
- Eliminate the following bugs in OC200: last name change does not work if there are multiple records for an account; transaction code CE is not accepted.
- Write a one-page addendum to the documentation of the deposits end-of-day program to reflect the latest changes.

At the project meeting, find out the following items: the expected volume of deposit transactions; purging criteria for the account master file.

At 5 p.m., pick up the daily task list and circle the task numbers which became results on that day. If all five items are circled, then you had a good RO day. Note that the tasks are very precise and specific. There's nothing vague about them.

In being specific you can easily judge your performance for that day — a yes or no for each task. The RO method forbids defining tasks which are general by nature. The following are examples of poorly defined tasks:

- Work on the update program.
 - Code 50% of the change logic.
 - Go to the project meeting.
 - Write some more documentation.
- Using general tasks, you lose the capability of monitoring your own progress in software development. How do you define tasks? You may get an assignment from your supervi-

sor which may take a few days or weeks to finish. The RO method helps you achieve success in the completion of the long-term tasks by making sure that you are effective in programming from day to day.

A daily task must be small enough to be accomplished on the same day. If you do not feel that you can finish it, break it down into smaller tasks. Frequently it happens that you have more than five tasks for a day. In that case, pick the five most important ones. A discussion with your manager or the user may help in sorting the tasks ac-

cording to priority.

You are using the RO method correctly if, on the average, you turn four tasks into completed results by the end of the day. If you are accomplishing all five tasks most of the time, then you have some additional capacity. The RO method will require you to increase the scope of your tasks. If you are finishing only two or three tasks a day, then the tasks are too big for you. The RO method recommends a decrease in the scope of the tasks.

Being an RO programmer also implies that you are ready to sacrifice

some nights or weekends to achieve important results by a deadline.

The RO method is equally applicable to nonprogramming tasks. The following example illustrates how you can apply it to any situation which requires results.

The task is to get the latest version of the sort utility from the ABC computer company. Your past experiences with this company have been frustrating. You cannot reach the responsible systems engineer, because he is never there. Even worse, he returns your call

(Continued on SR/52)



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CICS/VS Command-level Applications Programming • Design, code and debug CICS/VS command-level application programs • Invoke program, file, terminal and data management services • BMS input/output mapping	CICS02 CICS02 CICS02 CICS02	6-10 13-17 20-24 27-31	4-8 11-15 18-22
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'RO Method' Tailored to Programmer Needs

(Continued from SR/51)

a week later. The reachable systems engineer usually claims that he does not know anything about your problem.

So instead of going through weeks of frustrating experiences, you grab the magnetic medium and show up at 9 a.m. at the computer company. You explain politely to the receptionist what you want. In 15 minutes, she produces a systems engineer, who states that he never heard about the new version. Tell him that shouldn't matter, because you know that it is Version 2.3.2.

Then the systems engineer claims that he does not know if they have that version. Suggest immediately that he get on the terminal and find out. The sought-after version is there. You hand the systems engineer the magnetic medium and by noon you are back at your own office with the latest version of sort. That's RO.

Daily Order

Why does the RO method work? The main reason behind the success of this method is that it introduces order into the daily work of a programmer. It allows the programmer to focus on some particular tasks which are important in reaching the ultimate goal: the debugged program or system.

Without sharp focusing, one can easily get sidetracked by the intellectual work of programming. It is not just the programmer who has a hard time monitoring progress, but sometimes even the project manager becomes lost about the status of the software in development.

The reason for that is the elusive nature of the program product. Until it's

'Why does the RO method work? The main reason behind the success of this method is that it introduces order into the daily work of a programmer. It allows the programmer to focus on some particular tasks which are important in reaching the ultimate goal: the debugged program or system.'

ready for testing, it is almost invisible. The doctor's work is visible, so is a bus driver's. The programmer's work, on the other hand, can evade visibility until the deadline comes dangerously

close.

The RO method eliminates the difficulty associated in measuring the status of the software by precisely describing the various tasks which were turned into results. Thus the accomplished tasks can be compared to the outstanding tasks, creating a good measure for the monitoring of progress.

The RO method introduces the mental discipline needed to be efficient in software development. It will help you in achieving your personal career goal, be it advancement to a higher position or a better salary.

Besides the material gains, you will

feel more satisfied with your work. Your increased productivity will also help in the expansion of the utilization of computers, which will induce an upturn in our economy.

Give the method a try; see how it works. You must be fully committed; a half-hearted approach won't work. You'll be surprised at the results and, after a month, you will feel like a different person. Eventually you may discover that you are using the RO method in your private life for tasks which have nothing to do with computers.

Toth is vice-president, Program Resources, Inc. in New York.

HEY IBM, W

Solving Puzzle Of Productivity

(Continued from SR/50)

pervisors how to communicate a feeling of appreciation for a job well done.

There are techniques that can be practiced to develop the skill of reading people's feelings. Models of human behavior that create an atmosphere of trust and cooperation have been demonstrated. The patience and perseverance we were forced to acquire to deal with intractable computers can serve us well in human relations.

We may not be able to change people's attitudes toward their jobs and each other overnight, but our task is to create an atmosphere where people can feel like they are an integral part of a group that is doing valuable work.

Now before we go rushing off to be productive, let's clearly think through our priorities. Computers are a very powerful force in our society. They can free people from meaningless drudgery. What computers are actually used for will be a projection of what we computer professionals value and why we work. What we produce is the ultimate measure of our productivity.

Beeman is responsible for the programming supervision course at Rainbow Consulting, Inc.

INFO. THE PRODUCTIVITY LANGUAGE.

Ease Program Development Generators Smooth End-User Programming

By Tim Robinson
Special to CW

Use of generators promises to dramatically improve software development productivity. Their interactive environment simplifies programming by reducing the time required for idea capture and validation.

Also, elimination of the prerequisite mastery of an unnatural, complicated syntax makes it possible for end users to begin to do more of their own programming directly, which in turn reduces the inaccuracies that creep into program development when end users

communicate their needs through programmer/analyst intermediaries.

Application generators offer additional benefits. Because the executable version of a program is "generated" directly from its interactively derived specifications, the manual synchronization of a program's documented specifications and its source code is eliminated.

Because they are generating programs for a specific runtime environment, they can provide extremely powerful semantic features in their specification medium which serve to

reduce the knowledge requirements of users.

For example, the system can provide automatic rollback of aborted transactions without the user having to specify this complex activity.

The history of program and application generators begins in the early '50s with the development of high-level languages. The reasons that drove the development of the earliest high-level languages are probably best summed up by the authors of an early Fortran specification document, the "Preliminary Report, Specifications for the

IBM Mathematical Formula TRANslating System, Fortran," of November 1954. They cited the following justifications for the new language:

- Production of programs "automatically" for the IBM 704 computer.
- Virtual elimination of coding and debugging.
- Reduction of application development time.
- Increased computer throughput.
- Feasibility to tackle new mathematical applications.

Even in these early stages, when computer hardware-to-software costs were 4:1, software developers could see the handwriting on the wall. Applications were increasing in complexity faster than the programmer's abilities to deal with them.

Hardware costs notwithstanding, more effective means were necessary to develop software if these new applications were ever going to be tackled. This dilemma resulted in a couple of buzzwords, "high-level" and "automatic," often used interchangeably to refer to anything connected with the concepts of more powerful program development facilities.

Natural Expression

To automate programming, a mechanism must enable a human being to express algorithms naturally and succinctly as well as clearly and completely. With several hundred programming languages having been developed over the past 30 years, clearly what is natural and succinct to one person may not be so to another.

Nevertheless, our growth in understanding of the commonalities in programming solutions has led to relatively more automatic tools. The passage from the less automatic to the more automatic has gone through the following approximate states:

- Direct machine language coding.
- Assembly languages.
- Early batch-oriented high-level languages and report writers.
- Specific-use subroutine libraries callable by high-level language programs.
- Refined batch-oriented high-level languages with structured control statements and extensible data types.
- Interactive nonprocedural database query languages.
- Interactive menu-guided program and application generators.

Before the emergence of program and application generators, the artificial grammars were the primary media of programming algorithms.

The typical grammar's syntax was highly specialized and unnatural and frequently took a few months of constant use to master. As a result, the end user was cut off from direct use of the computer.

The unnaturalness of these grammars also created a need to document or specify programs in more understandable terms.

The execution time environment — such as virtual computer — provided by the early high-level languages was originally oriented toward a batch pro-

(Continued on SR/54)

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Generators Smooth End-User Programming

(Continued from SR/53)
gramming environment in which sequentially processed tapes were the primary mass storage devices and "batches" of cards the primary user input device.

During the late '70s, cheaper, faster disks made it more acceptable to trade off disk space and number of disk

accesses for the simpler, more flexible and tightly controlled file access environment provided by the data base management systems (Dbms).

Now, it was clear that batch programming was not an inherent characteristic of computing, but only one of several possible operational modes.

As is typical of new software

tools, names have no exact, widely accepted definition. Such vagueness encourages vendors, users and the press to use the terms rather loosely. Werner Frank's article in *Computerworld* entitled, "Will the Real Application Generator Stand Up?" [CW, Oct. 27, 1980] is a fine discussion of the current confusion

over this terminology.

Out of the confusion, however, enough common denominators have emerged from the many different generative products to justify viewing them as classes. These products use the terms "generator" and "automatic" to suggest that they produce or create ready-to-use programs with machine-like ease and precision.

They make this claim primarily on the basis that they have managed to replace the complex, artificial grammars, used by earlier batch-oriented programming facilities, with simpler, more natural, intuitive media for specifying algorithms.

These new media include "fill-in-the-blanks" and multiple-choice prompting, spatially-oriented graphics design sessions and more powerful English-like grammars. Just over the horizon, perhaps, we will also see the use of touch-screen and voice input.

Most of these techniques are critically dependent upon a real-time interactive man-machine interface, and this dependence explains why they are just now coming into widespread use.

Code Generators

Program generators might be better called "code generators" because they are used primarily as an aid to creating source code programs in some high-level language such as

Cobol or Basic.

Some go beyond just improving the specification medium by providing storage of program specifications — data dictionaries — and semantics — macros — to support a specialized runtime time environment. Depending on the completeness of these extensions, these products may be better described as application generators.

Application generators may or may not generate standard high-level language code. That is not their distinguishing characteristic. These generators provide their own complete, specialized, usually sophisticated runtime or execution time environments which may be simply and completely accessed through the semantics of its specification medium.

Program specifications are stored under the control of the application generator and may not be modified except through its control. The programmer is not normally allowed to see or modify the executable version of a program's specifications.

In the future, one can envision application generators for other specialized runtime environments such as process control, scientific analysis and simulation, computer-assisted instruction and computer-aided design.

Robinson is the founder of Software Design Automation, Inc., Round Rock, Texas.

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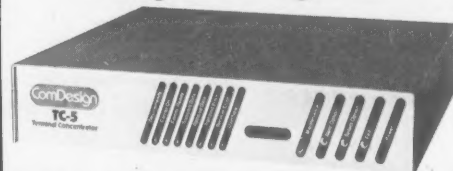
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While Cutting Staff 24% Bank Reaps Dividend of 70% Productivity Hike

Special to CW
HARTFORD, Conn. — An Application Enabling Study at Hartford National Bank and Trust Co. here has increased productivity over 70% in the Systems Planning and Development Group.

According to vice-president Thomas Anderson, systems development group manager, by implementing the recommendations of the study the staff was reduced by 24% and productivity increased about 70%. It was observed that the tests performed by each programmer increased by about 21% over a 16-month period and the number of items or programs submitted to the Quality Assurance Unit for implementation had increased 72%.

Also, by implementing interactive on-line compiling and debugging, CPU usage decreased 9% since programmers could compile and debug small pieces of work rather than submit and resubmit entire programs. Hand in hand with this, the lines of print produced for testing purposes was decreased by 69%.

"The results are rather spectacular," said executive vice-president James Daley. "It is an outstanding accomplishment by our systems people. They reviewed the bottlenecks and problems in our operations and were willing to report on them in an open-minded fashion."

"The management in data processing should be commended for their orderly review of their performance, since by identifying the problems they put themselves in a position to solve those problems," he added.

Prayer Answered

The group began the study in June 1979 in hopes of producing a more efficient and effective system development process, Anderson said.

"One of our major objectives for the Systems Planning and Development Group in 1979 was to increase productivity," he said. "We began looking at hardware and software, but found nothing that addressed the productivity problem in a comprehensive manner."

"About the same time we learned that IBM was developing the Application Enabling Study, an approach designed to identify specific systems development inhibitors. It was like an answer to a prayer."

"This was not a rescue mission, but a refinement process. We had a talented staff, TSO, on-line terminals, structured development methodologies

and all the bells and whistles which made us an above-average shop."

"But, we wanted to make greater headway in such areas as the backlog of systems and to reduce complaints from users regarding long lead-times. We knew such im-

provements would pay off," Anderson said.

"During the past 10 years at least," Daley added, "Data Processing has been in a high-growth mode. It was to the Bank's benefit to step aside and survey the growth in size and budget and see where we

could improve the use of dollars spent and increase our effectiveness."

"Data Processing had increased its number of programmers each year and had itself become very people-intensive. With the study we looked at how we could fur-

ther maximize the benefit of our resources," Daley said.

Team of 14

The method of study was to get people together from various areas of DP such as systems development, operations, (Continued on SR/58)

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grammer productivity of one hundred percent since switching to Condor."

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GENE ARMSTRONG, SYSTEMS PROGRAMMING MANAGER—HW SYSTEMS, INC., VAN NUYS, CALIFORNIA

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"We also found Condor much faster to learn and use. Condor's commands are simpler, and there's an on-line tutorial system to help our people learn a lot faster than with ICCF."

"Condor is the only system I've seen that gives complete access to all libraries. And Condor's total security can protect the integrity of every library member. Its warm re-start capability is something we didn't have with ICCF."

"Eliminating the restrictions of ICCF has made the move to Condor a gratifying experience."

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Supervisor Role Critical in Micro-Productivity

By Charles J. McDonough

Special to CW

In spite of the current surge of articles and speeches about productivity, the whole subject remains remote and mysterious to practically all Americans, no matter what their economic or educational level.

Business executives, for example, are unanimously in favor of improving productivity. But very few of them have given enough time and thought to the concept of productivity to be able to present a meaningful definition, even in terms of their own business operations.

Economists and politicians are speak-

ing out on the "national need to improve productivity." But they all seem to have difficulty agreeing on just what it is that needs to be improved, and by whom.

The real difficulty is that hardly anyone is willing to face up to, and put into words, the fundamental truth that what must be improved is "people productivity" — the average volume of work per worker. Not in the subjective and negative sense of a worker's personal exertion, strain or discomfort, but work in the sense of measurable output which can contribute (ultimately) to someone's enjoyment of The Good Life. "Speed-up" of the

employee's work pace is not the problem!

Root of Problem

The general problem is not the detail workers, but their immediate supervisors — and each supervisor's perception of his role in eliminating distraction and confusion in the work place.

Among management consultants specializing in productivity, it is axiomatic that practically all trained employees do their work at a satisfactory pace, without urging, if given the opportunity. That is, IF their detail assignments and task priorities are clearly stated, and IF they are not dis-

tracted by departmental or corporate problems beyond their personal control.

Problems like: "The rush job that's got to be done right away, but we don't yet have the necessary data or documentation." Or: "The work is falling behind, so we need more help . . . or a better computer program . . . or new equipment." Those are management problems, which the individual employee can do nothing about — except worry.

He can apply himself usefully only to that particular piece of work which is assigned and available for him to work on at that moment. And that's the supervisor's responsibility.

For 18 years I have operated a consulting practice specializing in improving productivity. Our files of case histories show that in most departments in most organizations, productivity can be substantially improved — with no change in equipment or employee skills.

It still takes people to implement the technology, and today there is probably even greater myopia regarding the role of the supervisor. Employees still want clear answers to questions like, "Who's in charge here?" "What job am I supposed to work on next?" "Who do I have to satisfy?"

Over and over again we find that detail workers respond beautifully to a more orderly, more detailed working relationship with their immediate supervisor. That's the quickest and cheapest way to improve productivity, as opposed to the common view that technology is the whole answer.

Two Dimensions

Productivity actually has two very different dimensions: long-range and short-range, or macro-productivity and micro-productivity.

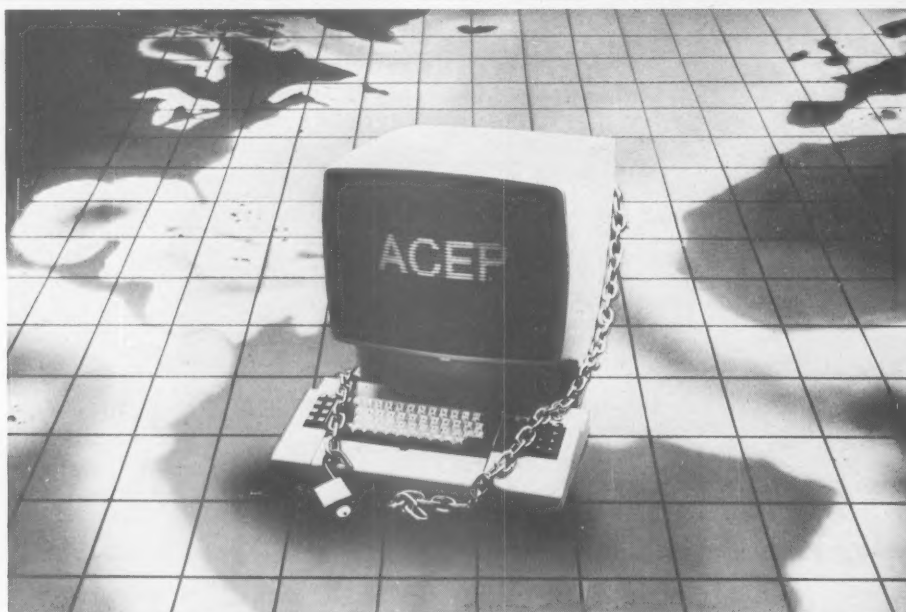
Development of ever more sophisticated machines and equipment is essential for long-range, evolutionary progress in productivity. That's the macro-productivity objective. But the mere existence of work-processing equipment is no assurance that such capital assets will be used effectively. Right now, America is not doing very well with the capital equipment we already have. Why? Because of American management's widespread neglect of the micro-productivity factor.

All detail work, in any organization, is accomplished by individual employees working as members of a supervised group. At that micro level, the key to productivity is neither the equipment nor the employees; it is the group leader, or supervisor. The equipment is whatever it is; practically all employees on any payroll have the necessary skills, and they are willing to apply their skills to whatever tasks they may be assigned.

Thus, in any department, today's productivity is determined almost entirely by how well the supervisor directs the work activities of his group using today's equipment.

The conventional wisdom holds that increased capital investment is substantially the only path to greater productivity. That assumes that existing facilities are all being utilized adequately, all detail employees are being

(Continued on SR/58)



Installations everywhere are finding a way to unlock programmer productivity.

ACEP is the personal computing system that was specifically developed for IBM virtual memory control programs (VS1 and MVS). This system makes it possible to enjoy increased on-line productivity while using only a fraction of the resources required by older time sharing systems.

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ACEP uses re-entrant programming and modular design. The result is a low overhead system that gives all of your users the tools they need for program development and maintenance. Using on-line (foreground) conversational tools they can: execute batch, on-line and utility programs; perform full or split screen text editing; and direct job output to

preferred locations. Additionally, users can check both job and system status by reviewing items such as: job que, system catalog, library contents and other significant information. Users have their own libraries and multiple working areas. There are no JCL restrictions and data sets can be dynamically allocated.

Installation Benefits

Installations using ACEP benefit from its efficiency, simplicity and security. The system is so logical and straight forward that it is easy to install and easy to use. ACEP does not require modification of operating system routines and most programmers have it up and running in just half a day. Additionally, data access and

command execution can be restricted at the user level.

ACEP, which has a constantly active "hotreader" for the VS1 system, interfaces to several source program maintenance systems and can be accessed through VTAM, BTAM, TCAM or existing CICS or Intercomm terminals.

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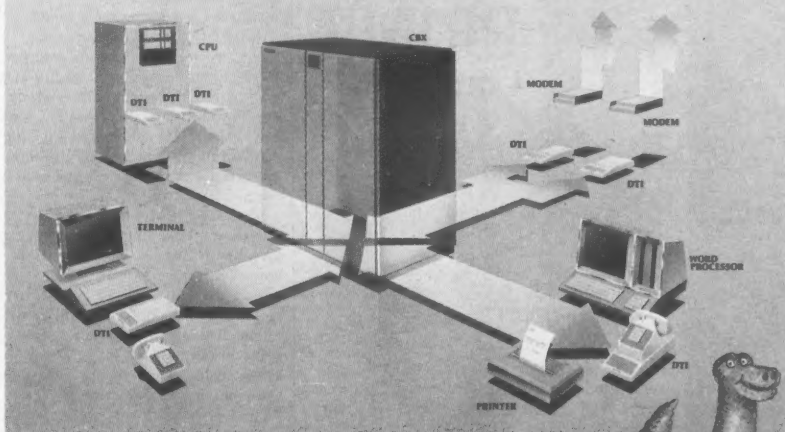
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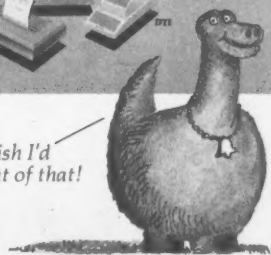
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I wish I'd thought of that!



Bank Reaps Dividends of 70% Productivity Hike

(Continued from SR/55)

quality assurance, software and the user community. IBM participated with five of its business systems planning people who are leaders in structured systems design and were able to serve as mediators in the discussions.

The team of 14 dedicated themselves to the task by going off-site for a week to thrash out what the problem areas were and how they might best be addressed.

Anderson attended the session to give management's perspective. "At first, it was thought better that I not attend; that my presence would stifle communication. But, we also wanted

to be realistic as to what we could expect and everyone's input was necessary," he said.

"The resultant study was frank and constructive. Although seemingly negative since it talked only of problem areas, it was constructive as it let us objectively consider possible solutions to enhance our operations.

"At first, senior management was surprised that we would 'air our dirty laundry' so openly, but we weren't looking at what we were doing right; we were looking at where we could do even better," Anderson remarked.

During the course of the week, the team developed 41 observations which

they felt were bottlenecks to the development process. One such observation was that programmers spend too much time on clerical work and documentation.

These various observations were then categorized and grouped to arrive at issue statements such as, "Because there is an insufficient administrative and technical support staff within Systems Planning, we are unable to get clerical work done in a timely fashion, resulting in programmers doing clerical work such as typing, instead of programming."

Ten unique issue statements were formed and the group then developed

specific action plans to address each issue. These action plans outlined the target date for the action, what would be done, and what the objectives and benefits were. For each of the 88 tasks, a coordinator was named with a completion target date and the man-days estimated for the task.

For the above example, to reduce the amount of clerical work programmers did, word processing was implemented to increase the productivity of secretaries and handwritten documentation is permitted in some instances.

One of the outcomes of the study was to dedicate one computer to development and obtain a data base management system which reduced the CPU usage and increased the effectiveness of the programmers.

Nonparochial Approach

Another example of taking a non-parochial approach to a problem was hiring a person to deliver output listings. "We had isolated one problem which was turnaround with program output," Anderson said. "We thought getting a printer for our area would solve it since the programmers wouldn't have to go to the operations area, which is a secured area two floors down.

"We looked into the costs for our own printer, the salary for someone to run it and the space needed. We found that it was better to hire a person to pick up and deliver the reports. We could dedicate the high-speed laser printer we already had to testing during the first shift, save each programmer about 20 minutes per day, and not have the noise factor to worry about. It was just a matter of looking at the options."

Supervisor Plays Critical Role

(Continued from SR/56)

directed in a systematic manner and there is only negligible lost time.

The truth is that prompt improvement in productivity is readily attainable in most departments — along the micro-productivity dimension — without waiting for additional investment in equipment. The only requirement is specific training for each supervisor in micro-productivity techniques.

Where supervisors are given such on-the-job coaching and support, major improvements in productivity are consistently being realized — commonly 10% to 25% more output per employee with the same equipment.

This has been going on quietly for some years now, in all kinds of work areas, in hundreds of organizations — even in some government agencies. But most economists, politicians and business executives continue to focus exclusively on the long-range financial problems of upgrading the technology of the work place. They remain oblivious to the fact that supervisor training in the specifics of micro-productivity assures cost-effective utilization of employee skills.

McDonough is president of McDonough Management Corp., Buffalo, N.Y.

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At Life Insurance Firm Quality Circles Open Productive Exchanges

By Ellen Gottesdiener
Special to CW

HARTFORD, Conn. — Connecticut General Life Insurance Co. here has six systems departments, each of which provides design and programming support to a particular area of the business. Individual Insurance Operations Systems, or IIO Systems, is one of these departments and it supports the Individual Insurance Operations data processing needs.

IIO Systems has a Quality Circle program in operation. Quality Circle, or QC, is a group of voluntary department members who meet regularly on company time to identify, analyze and make recommendations to improve their department's effectiveness. The goal of the program is to improve the quality of the work environment, improve analyst/programmer productivity and improve service to IIO's customers.

The IIO Systems director was interested in pursuing a productivity improvement program similar to the Japanese Quality Circle concept. Quality Circles were initiated in Japan in the early 1960s in order to improve product quality.

Their concept of worker-initiated change has been used in the U.S. by a number of companies, mostly in manufacturing environments, with some success. With this in mind, two IIO Systems people adapted the concept for the department based on research of the QC concept, work improvement programs and department plans.

They formed a QC program consisting of a research team, a coordinator and a review team. Members of the research team analyze issues as a group, research, make recommendations, and serve as representatives to their functional areas. This group consists of eight programmers from different areas of the department.

The coordinator, also a programmer, is responsible for program operation, provides management with QC status and solicits their input and serves as a link between the research and review teams.

The review team provides guidance to the research team and meets as a group to review all recommendations as they are being developed by the research team. This group consists of six individuals from each of the department's functional levels, ranging from senior analyst to department management. Membership is voluntary and length of involvement is flexible.

The QC program is free to investigate any issues pertaining to work life improvements except benefits and salaries, personnel and corporate policies, and personalities. Each recommendation is designed to state the problem, the symptoms resulting from the

problem and the proposed solution.

After the initial start-up of the program, the research team issued a departmentwide questionnaire aimed at identifying concerns and soliciting suggestions. Within four months, the group has made

three recommendations and is now in the research phase.

The Quality Circle effort in Connecticut General's IIO systems department provides a vehicle to identify opportunities which can improve department productivity and enhance the quality of the

work environment. It serves as a useful communications tool, permitting a meaningful exchange between department personnel and management.

Gottesdiener is a training coordinator at Connecticut General Life Insurance Co. in Hartford, Conn.



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system from which researchers can obtain documents and patents efficiently. It is all accessible through a macro-generated

to serve its clients just as a service bureau would. Each user has his own budget and he could go outside if he wished. That means our service has to be as good or better than could be purchased outside. Our service is paid for by earning those budget dollars of client departments; it makes us all work a lot harder. Thanks for a great deal of our productivity goes to INQUIRE.

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DG Aims First Package At OEMs

WESTBORO, Mass. — Data General Corp. announced its first generalized applications software here.

Designated the Genap Financial Series, the software consists of four accounting products — accounts payable, accounts receivable, payroll and general ledger. Each of the packages may be individually installed or combined to form an integrated whole.

Primarily targeted toward the OEMs with sales between \$2 million and \$30 million, the series is also available to large end users, according to a firm spokesman.

Development and runtime software, which is a prerequisite for the financial series, includes a file management system with data dictionary and logging facilities, librarian, program modules, master menu and security system and jobs batch stream processor, he explained.

Available on models 40 through 70 of DG's Cobol-oriented commercial systems small business computers, the entire financial series is priced at \$12,600, with the development and runtime software costing an additional \$1,400. Each of the four applications products costs \$2,800 if purchased separately, and all quoted prices are for an initial license that includes installation, one-year software subscription service and 90 days of comprehensive support service.

Delivery is quoted at 90 days from DG at Rt. 9, Westboro, Mass. 01581.

Free-Form English Report Writer Compatible With IBM OS, DOS

GRANADA HILLS, Calif. — Dylakor here announced an IBM-compatible free-form English-language report writer/utility software package designed for OS and DOS operating systems.

DYL-280 is a free-form system that includes a capability for fixed-form parameter entries. This duality allows the end user to opt for the increased readability, ease of use and CRT terminal orientation of the free-form package. However, the fixed-form feature, with self-prompting parameter forms is still available when desired, a spokesman noted.

Including most of the capabilities offered by DYL-260, another report writer/utility marketed by the firm, DYL-280 features automatic composition, control breaking, editing, totaling, titling and formula calculations and provides the user complete control over the report format, he continued.

Compiled Programs

Compiled DYL-280 programs can also be saved and invoked directly from a library without reprocessing and validating the source statements, Dylakor said.

The package handles up to eight input files, eight output files in standard sequential, Isam or Vsam formats and fixed, variable, variable spanned (under OS) and undefined record formats, the representative said.

Conditional statements and branching provide "unlimited

data selection and handling capability," he claimed, and sorts are possible at any point in the program via a SORT command.

Additional product features include:

- A user exit facility to allow special processing in Cobol, Fortran or Assembler.
- A COPY facility to store DYL-280 code for later inclusion in the program stream.
- Arithmetic expressions that can be entered with one statement to eliminate separate add, subtract, multiply and divide commands.
- File print options that include graphics and/or hexadecimal output.
- Indexing/subscribing facility to handle tables, record scan-

ning and variable record segment processing.

Offered for a free trial period, with a discounted rate for a three-month time span, DYL-280 will be marketed under the same plan as the firm's other products, according to Stephen Hicks, marketing vice-president.

Available under OS this summer and under DOS in the third quarter of 1981, a three-year lease will cost \$127.25/month to be paid annually, he said.

One- and two-year leases are also being offered, and DYL-280 will be available to the firm's existing customer base for a "small one-time-only handling fee," Dylakor said from 17418 Chatsworth St., Granada Hills, Calif. 91344.

Prime Extends DBMS To Inexperienced DPers

NATICK, Mass. — Prime Computer, Inc. has added a Query/Report Writer to its data base management system (DBMS), which it said will extend the use of the DBMS beyond DP professionals to those with little or no programming experience.

Navigation through the DBMS data base is handled internally with use of the enhancement. A number of users can independently query the system to determine which data base is required and what, within that particular data base, each wishes to view, a

Prime spokesman noted.

Once information is retrieved using the Query/Report Writer, data can be displayed in different formats on a printer or terminal. A variety of subsystems, such as retrieval, formatting and cataloging, enable the DBMS user to perform a number of reporting functions with a single command.

Other DBMS customer features include interactive data base administration and independence, minimal redundancy, data integrity, backup and full recovery, the spokesman added.

The Query/Report Writer represents the most recent enhancement to Prime's DBMS, and advanced implementation of Codasyl, which is designed specifically for an interactive on-line environment.

The cost of the Query/Report Writer feature is \$10,000, Prime said from Prime Park, Natick, Mass. 01760.

Nested Arrays System Added to APL

BETHESDA, Md. — A major extension to the APL programming language, a Nested Arrays System, has been released by STSC, Inc. STSC's system is reportedly the first commercial version of nested arrays.

APL primitive functions pro-

cess an entire multidimensional table or array of information at one time, where each item in the array is a single value. In a nested array, any item in the array can itself be an array of any rank, shape or type. This allows a more natural, nonrectangular repre-

sentation of data as it commonly is found in business applications, STSC said.

The Nested Arrays System also includes new APL primitive functions and operators to take advantage of the ability to repre-

(Continued on Page 70)

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- **MSI is already being used** in well over 400 installations throughout the world.



Global Console Director

The Global Console Director is an extremely flexible tool. It allows (selected) message streams from different systems to be logically "blended" to create a **unified system image** to whatever degree desired. In a slightly different vein, GCD allows any console on any system to be logically attached concurrently (and perhaps in different ways) to any set of systems in your complex!

GCD allows commands entered from any console to be directed and processed anywhere in the complex; in this respect, all consoles are effectively linked to all systems. In almost every aspect, GCD is philosophically and operationally compatible with the standard system console support.

GCD can improve overall throughput by simplifying operations. By allowing several physical consoles to be logically merged, excess devices can be eliminated for immediate savings, or deployed elsewhere to strategic advantage.

GCD is absolutely transparent to your users, and aside from major simplifications, nearly transparent to operations.



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TI Enhances DX10 Software By Expanding Support To Silent 700 Terminals

AUSTIN, Texas — Texas Instruments, Inc. has enhanced its DX10 disk-based operating system by expanding support to TI's Silent 700 terminals to include the models 763 and 765 bubble memory terminals and the 120 char./sec models of the 780 series.

The DX10 3.4 software also provides support for the DC1400 cartridge disks (standard on the DS990 models 7, 9 and 29; optional on other DS990 models from 4 and up), the vendor explained.

The product includes on-line diagnostics that require less disk space than earlier versions and an easier to use operator interface, the vendor claimed.

Three Levels

Three levels of programmed instructions allow the operator to specify a proficiency level: inexperienced, experienced or expert. The system responds by prompting at the designated level.

DX10 now includes development support in Fortran, Fortran 78, Basic, Cobol, Pascal, TPL, RPG II and assembly, a spokesman said.

Communications support is

provided for 3780/2780, HDLC, Tilink, Remote Terminal Support and 3270 ICS, the spokesman added.

Software license fees for DX10 3.4 range from \$3,600 to \$4,400, depending on selected media. The vendor can be reached through P.O. Box 202145 H-569, Dallas, Texas 75220.

'Data Catalogue 2' Enhanced

BEDFORD, Mass. — Synergetics Corp. has announced a new release of its Data Catalogue 2 data/procedures dictionary for OS IBM users that features expanded IMS support, enhanced ability to generate PL/I code, Vsam attributes and improvements in Mark IV features, the vendor said.

Release 2.1.4 includes more attributes for the Data base (DBD) and Program Specification Block (PSB) in its support of the IMS data base management system.

These DBD and PSB attributes — used for recording characteristics of dictionary entities such as elements and data base — report-

edly mean additional retrieved and reporting capabilities as well as more useful output in DBD and PSB generation and conversion.

The improved PL/I generation means users can store their PL/I data definitions in the dictionary; at any time thereafter they can generate PL/I code that can be entered into a PL/I compiler.


The basic Data Catalogue 2 package costs \$15,900; Data Catalogue 2's IMS support costs \$5,000; and the Mark IV interface costs \$3,000.

Synergetics Corp. is headquartered at One DeAngelo Drive, Bedford, Mass. 01730.

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Note: Screen as shown is 85% of actual size.

DISPLAYMASTER is the CRT with true "personality" in user definability. The terminal can emulate 90% of all asynchronous units now on the market and is compatible with most mini, micro and full computer systems.

Features that some consider "options" are standard with DISPLAYMASTER. Yet it goes that extra step to offer several other important choices to the user:

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- Custom emulations
- Light pen
- Second 128 character set
- Custom character set
- 32K display memory

To give your CRT—or one you're presently considering—the Rhino Test, simply clip out our Rhino ruler. If your CRT doesn't measure up, then you're not getting the expanded view of DATAVUE. P.S. We know we'll win by at least half a rhino or more!



STSC Adds Nested Array To APL

(Continued from Page 69)

sent data in its more natural, nonrectangular structure.

The system will be available to new and existing customers of STSC's APL*Plus Service as an experimental research implementation at no extra charge through January 1982. At that time, selected features will be permanently implemented, according to a vendor spokesman.

STSC will hold workshops on nested arrays beginning in April in major U.S. cities.

Information on these workshops may be obtained by contacting Paula J. Brooks at (301) 657-8220.

STSC is located at 7316 Wisconsin Ave., Bethesda, Md. 20014.

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'Strobe/CV' Monitors Programs in Large Jobs

CAMBRIDGE, Mass. — Strobe, an application program performance measurement tool, has extended its monitoring capability with Strobe/Central Version (CV), according to Programart, its vendor. The new version is said to be useful in analyzing and improving performance of on-line subsystems and of large, long-running batch jobs.

Strobe/CV captures program

performance "live." The performance analyst can initiate the monitoring of programs already in execution — or scheduled for later execution — from an operator's console, a TSO terminal or a batch job entry facility.

The user can control the sampling process throughout the measurement session by issuing sampling control commands that start and stop sampling, or switch sampling

output to a new sample output data set.

By selectively sampling periods of peak activity, the user can obtain a Program Performance Profile showing on-line subsystem behavior during heavy loading.

Through periodical switching of output sample data sets, the user can obtain profiles showing program behavior during various processing phases.

The Strobe Program Performance Profile displays how a program or subsystem utilizes computer resources. If the problem program is burning up CPU cycles, Strobe shows where the activity is heaviest — by module name, control section name and location within section, the vendor said.

For most on-line subsystems, including CICS and Intercomm, CPU activity is attrib-

uted to transactions by name, as well.

If execution of the monitored program is delayed by input or output operations, Strobe/CV reportedly reveals which data sets and units are responsible.

For each data set, it shows I/O busy time, CPU servicing time (time spent in IOCS routines for the data set) and CPU wait time. Each is indicated as a percentage of elapsed time during the measurement session.

Disk Activity

Strobe/CV also shows disk activity by unit and cylinder. Suspected contention, which may be caused by two jobs concurrently accessing the same disk storage unit, can be confirmed by Strobing both jobs simultaneously, the vendor said.

According to Programart, Strobe/CV enables users to analyze performance problems while they are happening.

Even problems with transient symptoms reportedly can be caught with the "stop motion" of a strobe light when the symptoms occur.

Strobe/CV is available for IBM MVS operating system users for \$16,000 from Programart at 30 Brattle St., Cambridge, Mass. 02138.

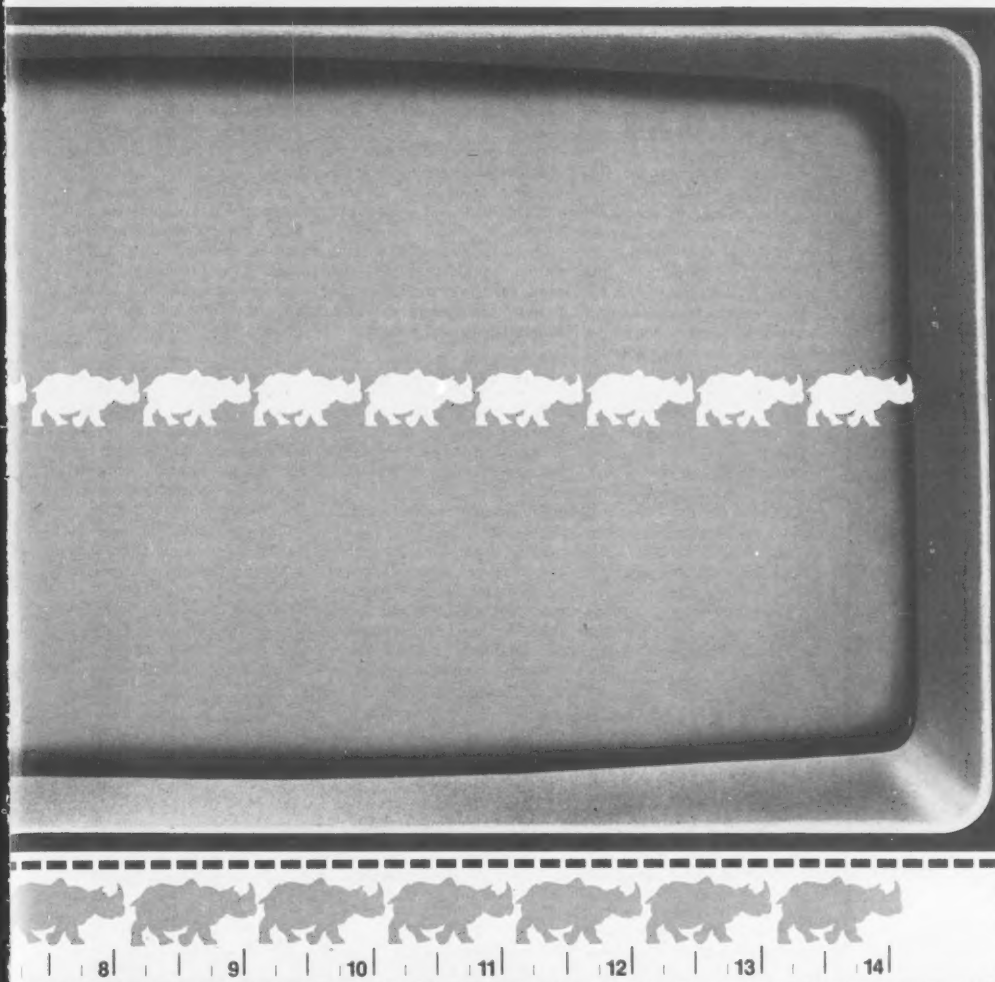
'CICS/Table Aid' Records Updates In Vsam Files

NEW YORK — FTW Associates has enhanced its CICS/Table Aid with a facility to provide permanent updates and additions to the Program Control Table and Processing Program Table.

The facility records all on-line changes and additions in an IBM Virtual Storage Access Method (Vsam) file accessed during subsequent start-ups, the vendor said.

The optional facility is priced at \$500, but will be available at no extra charge to users ordering CICS/Table Aid through May 15.

FTW Associates is headquartered at 120 Wall St., New York, N.Y. 10005.



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'Score' Cobol Generator Offered for HP 3000

NEW YORK — Score, a Cobol program generator with the ability to define program requirements in the form of nonprocedural statements, is now being offered to Hewlett-Packard Co. 3000 users.

According to its vendor, SDA, Inc., Score creates a functional Cobol program by only specifying the problem variables. It enhances the capability of a Cobol programming facility by reducing scheduled time as well as the cost of implementation demands, the firm said. Output is a 100% Ansi Cobol program that can be saved, edited or immediately compiled and executed.

The HP version of the Score program generator costs \$22,000 from SDA, 26th Floor, 475 Park Ave. S., New York, N.Y. 10016.

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Three Pricing Options

Intel Updates 'System 2000/VSE'

AUSTIN, Texas — Intel Corp.'s Systems Group has announced updates for its System 2000/VSE, which is compatible with Release 2 of IBM's DOS/VSE, as well as three new pricing options besides purchasing.

System 2000/VSE provides data base management capa-

bilities to small DOS/VSE shops using IBM's 4300.

The basic package includes multiuser support, Intel Corp.'s Basic Data Dictionary, queue access, one programming language extension, an accounting log, integrated recovery and Quest, Intel's query language.

The basic package costs \$49,500. The monthly rental

fee for a typical configuration ranges from \$1,400 to \$1,800.

Three new approaches to pricing for all System 2000/VSE and System 2000/80 series include a one-month rental plan, 12-month committed rental and an installment lease plan.

Intel is located at 12675 Research Blvd., P.O. Box 9968, Austin, Texas 78766.

Chargeback Fits AOS

NORTH STONINGTON, Conn. — A chargeback system for use under Data General Corp.'s Advanced Operating System (AOS) which charges account numbers for system resources independent of surname is available from Analysis & Technology, Inc.

Account Charging for Resource Usage (Accru) allows users to charge to any valid account number when logging on to the system without affecting any parameters in the user's file, the vendor claimed.

After entering surname and password, the user is prompted for an account number. If he cannot provide it, he is logged off the system. Once a valid account number is entered, the user is logged on the system.

The system consists of five programs and utilities and, as currently implemented, charges for connect time, elapsed time, CPU time, I/O blocks, page-seconds, plot paper and plotter time.

Accru is priced at \$1,500, the vendor said from P.O. Box 220, North Stonington, Conn. 06359.

Users Group Completes Survey of Bell Labs' Unix

SANTA CRUZ, Calif. — A recently formed association of companies and individuals interested in Bell Laboratories' Unix operating system has completed a survey of Unix users.

The survey addresses the areas of Unix features, application areas and available software, as well as a users group profile.

The survey found a large potential for Unix-based systems, especially in office automation and interactive data base management areas.

Respondents indicated that the greatest strengths of the operating system lie in user interface, hierarchical file system, standard programmer's utilities and its ability to port application programs to different machines running Unix.

For further information, a summary is available for \$15 and a comprehensive analysis can be obtained for \$75. The Santa Cruz Operation, Inc. is headquartered at 500 Chestnut St., Santa Cruz, Calif. 95060.

Tool Made for Partnerships

DENVER — A software package designed for the oil and gas industry has been developed by Gathers Software, Inc.

The on-line, interactive data base system features a partnership management capability patterned specifically for oil exploration and development partnerships, but applicable to any similar limited partnership formation.

The system also provides for

general ledger, payroll, accounts payable and receivable, lease management, joint interest billing, revenue distribution and authorization for expenditures.

The software package is available on a time-sharing or in-house basis. It ranges in price from \$30,000 to \$100,000, depending upon the size of the company, Gathers said from 3888 E. 45th Ave., Denver, Colo. 80216.

Basis DBMS On Geico Net

ROCKVILLE, Md. — Basis, an information retrieval/data base management system developed by Battelle Memorial Institute, is now available via the General Electric Information Services Co. (Geico) Mark 3000 time-sharing network, an IBM-compatible service.

Flexible Retrieval

Basis is designed to implement applications requiring flexible retrieval and on-demand reporting and those dealing with textual or abstract data.

It supports textual and numeric data bases of all sizes and consists of eight modules that allow users to define, load, edit, verify, update, retrieve, query, report and maintain data base information.

Battelle is located at 505 King Ave., Columbus, Ohio 43201.

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BLOOM is our report writer, and is designed to produce simple or complex reports from a SEED data base without the need for special programming, a feature which we believe you will appreciate. The report definition language is a non-procedural language for specifying the desired report. BLOOM was written so that your users do not need to know the structure of the data base. Report definitions may be stored for repeated use against different portions of the data base. Features you should know about are: control breaks of up to 15 levels; definition of temporary variables; complete page formatting; functions for total, maximum, minimum, average, standard deviation, and variance; and directed output to a terminal or printer.



GARDEN is our on-line data manipulation language that will aid the data base administrator and programmer. It provides facilities for interactive update and retrieval. We suggest you use GARDEN to verify procedure correctness, check data base integrity, fix errors in the data base, or create a test data base. Especially significant features include: prompting, conditional tests, "HELP" facility, looping, graphing, stored procedures, and on-line access to the data directory.

SPROUT is a multi-purpose file/data base conversion tool that allows transactions to be processed into and out of a data base. With SPROUT, you will find it easy to convert existing files to a data base. Or, if a data base is already in place, SPROUT can be used to create files for transport to a non-data base environment. Our customers tell us that they have found that SPROUT speeds conversion of data and eliminates the requirement for an immediate switch-over to converted programs.



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IFBR Utility

'Rabbit-5' Works Under VAX/VMS

WEST PALM BEACH, Fla. — Rabbit-5, a VAX/VMS software utility system that provides incremental backup and restore capability for data files, has been introduced by Raxco, Inc.

Rabbit-5 Incremental File Backup and Restore (IFBR) reportedly is designed to provide maximum efficiency for both the user and the computer system when saving and restoring data files. Files are saved and restored at speeds approaching tape passing speed, Raxco said.

The user may select file names, extensions and versions to be saved and/or restored. "Wild card" operations are permissible.

Rabbit-5 operates in a "novice"

mode, in which a prompt requests "fill-in-the-blanks" information, and an "expert" mode, in which all system commands and wild carding is permissible.

Written in Fortran-IV and macro as-

sembler, Rabbit-5 will operate under VMS Version 2 and above. It may be purchased for \$3,750 or rented for \$149 per month.

Raxco is located at 3336 N. Flagler Drive, West Palm Beach, Fla. 33407.

PDP-8s, 11s Get Projection System

SANTA ANA, Calif. — A financial analysis and projection system designed for use on Digital Equipment Corp. PDP-8 and PDP-11 equipment has been introduced by Pyramid Data, Ltd.

According to Pyramid, the package is geared to any business user or financial consultant needing to run or rerun projections to see the impact of

changes in various factors. Applications include tax and estate planning, cash, personnel and sales projections and real estate, construction and manufacturing analyses.

For the PDP-8, the system costs \$525 and for the PDP-11, \$750.

Pyramid Data Ltd. may be reached through P.O. Box 10116, Santa Ana, Calif. 92711.

Generator
Runs on Lexos

RICHARDSON, Texas — An automatic application generator running under an operating system with multi-tasking and virtual memory facilities has been announced by Software Automation, Inc.

Designed for the small business market, Autopilot's operating system, Lexos, is self-compiling and written in Forth, a transportable systems language that can be used on machines such as Digital Equipment Corp.'s PDP-11 and LSI-11, IBM's Series/1, Honeywell, Inc.'s Level 6, Data General Corp.'s Nova and Texas Instruments, Inc.'s TI-990.

The aim of Autopilot, Software Automation said, is to bring to the small business market many of the features typically available only on large mini-computers and mainframes.

Autopilot is available at prices ranging between \$700 and \$5,000 from Software Automation, Inc., 1100 Business Parkway, Richardson, Texas 75081.

Data Bases Give
Product Info

LEXINGTON, Mass. — GML Corp. has announced an on-line information service that reportedly gives users access to 12 data bases containing information on more than 10,000 computer and peripheral models made by more than 850 U.S. and foreign companies.

The information is updated continuously and can be accessed through asynchronous half- or full-duplex terminals from an outside service bureau at a cost of \$75 per hour, or GML will supply IBM-compatible tapes, the vendor said. The cost of the tapes depends on the support GML provides and the size of the organization.

More information about the system and details about demonstrations are available from the director of marketing, GML Corp., 594 Marrett Road, Lexington, Mass. 02173.

You'll get a hard look at the software market in Computerworld's May 25th Special Report "Systems and Utility Software."



How far has the systems and utility software market come and what future trends should users be on the lookout for? *Computerworld* has some answers—based on extensive research we've conducted in this sector of the software market. In this comprehensive Special Report edited by Rita Shoor, you'll read:

- The difference between the apparent cost of software and the price you really pay through bad record keeping, lost discounts and other hidden costs.
- How the right utility software can improve your thru-put and application development in your organization.
- A review of how end-users put these "workhorses" to use and take advantage of hidden values.
- Plus, accounts of user experiences and tutorial essays along with reviews of current products and predictions about future trends.

If you're an MIS executive, DP Manager, Supervisor or Programmer, you'll find our May 25th report especially valuable. If you market systems or utility software, your ad should be there. Ad close is May 8th. For details, contact your *Computerworld* representative. Or, to reserve ad space, call Frank Collins at (617) 879-0700.



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"On the other hand, the network system can handle more complex applications. If growth and a changing database are in your future, and your requirements include a variety of batch and on-line jobs to be run in production mode, then the network system will best satisfy your needs.

"If you determine that you need a network system, then IDMS is the only way to go. IDMS provides features that are essential in a database management system. IDMS is easy to use, it is transparent to COBOL, and record types accessed together will usually be stored together. IDMS improves hardware efficiency and makes more economical use of memory by reducing data redundancy. In addition, IDMS has a fully-integrated data dictionary, another requirement all database management systems should meet."



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To learn more about the benefits of network systems and IDMS, the dictionary-driven DBMS that meets the six key factors for success in database systems, attend a free seminar in your area.

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'Best/1' Gets Productivity Upgrades

WALTHAM, Mass. — BGS Systems, Inc. has announced Best/1 Release 6, which reportedly adds major productivity and functionality enhancements to this capacity planning and performance prediction software tool.

The "repeat" facility enables an analyst to use a single command to automatically step through an entire "What-If" capacity planning study.

The internal Best/1 queuing theory algorithms have been performance-tuned so that even complex models can

run interactively. In addition, Best/1 Release 6 provides a new output file, which can be directly interfaced to SAS for statistical analysis or colored graphics presentation.

Priority Distribution

Best/1 now supports priority distribution, which enhances modeling of the CPU dispatching algorithm for more detailed and accurate multiperiod TSO models.

The unconstrained multiprogram-

ming level reportedly improves the treatment of overhead such as JES, started tasks and reentrant codes. The response-time distribution report permits a more detailed analysis of real-time systems such as IMS and CICS.

Best/1 Release 6 is being shipped automatically to those of the 150 installed sites currently covered by BGS maintenance. Its price ranges from \$19,000 under MVS systems to \$24,500 under other operating systems, including VM/CMS, Sperry Univac 1100 Exec, Burroughs Corp. and Honeywell Information Systems, Inc. GCOS.

BGS Systems, Inc. is headquartered at 470 Totten Pond Road, Waltham, Mass. 02254.

'FPI-1' Offered For System/34

SAN FRANCISCO — An interactive and menu-driven query/report-writer package for the IBM System/34 has been developed by Fusion Products, Inc. FPI/1 is an interpretive software package supported by a data dictionary, which enables a nontechnical user to display or print information from existing files, the vendor said.

A menu for each operation directs the user in building a retrieval, modifying retrieval, printing a report or displaying data on a screen. Designed to be user friendly with a Help text screen available behind every operation screen, FPI/1 can access files using full, partial or range key values.

Users can select information from multiple files, sort in any sequence, subtotal breaks and compute new data fields. The report format is user definable and multiple print lines may be used.

The one-time license fee for this stand-alone package, which the vendor said can operate with any other software, is \$3,000 for one copy, with multiple copy discounts available.

Pregenerated dictionaries are available for major IBM application packages at an extra charge. Maintenance is included for the first year and thereafter will be 10% of the current purchase price, Fusion said from 3022 Steiner St., San Francisco, Calif. 94123.

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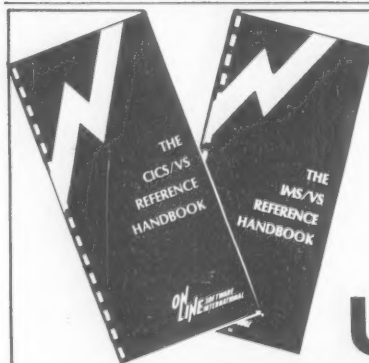
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Language Boosts CICS Tasks

SALT LAKE CITY, Utah — A procedural language designed to enhance the development of CICS applications by providing arithmetic calculations, data manipulation and complex logic and record-handling capabilities has been introduced by Productivity Systems Association, Inc. (PSA).

Release 2.0 of the On-line Productivity Tool was also designed to provide capability for handling DL/1 multiple Vsam Isam files and multiple record types within a single file.

It is available from PSA on a 30-day free-trial basis from 335 S.E. Orem, Utah 84057.

System/34 Gets Screen Formats

COLUMBUS, Ohio — A screen format generator for the IBM System/34 said to permit user design and modification of screen formats on-line, while reducing development time, is available from Applied Business Systems, Inc.

The user of Abscreen "paints" the format on the screen by specifying a

line number and the data for each display line, the vendor said. Entire lines can be moved or duplicated anywhere on the screen by specifying a new location for the line.

Abscreen is priced at \$575 from Applied Business Systems, Inc., 1550 W. Henderson Road, Columbus, Ohio 43220.

'Spread' Now Runs on System/34

HANOVER, N.H. — The Spread financial analysis and reporting system is now available on the IBM System/34 from Lupfer & Long, Inc.

Spread is an interactive financial planning package designed to provide a sophisticated modeling capability to users with little programming experi-

ence. It is available for \$4,000 on the IBM System/34.

Spread is also available on Digital Equipment Corp., Hewlett-Packard Co., Prime Computer, Inc. and Wang Laboratories, Inc. computers for \$16,000 from Lupfer & Long, Inc., Box A-57, Hanover, N.H. 03755.

System Aids Property Managers

SPRING HOUSE, Pa. — A property management accounting system designed for either commercial, retail or residential property management firms using the IBM Series/1 CPU has been announced by Whelan Associates, Inc. in conjunction with H. H. and B. Realtors.

The system consists of four modules,

usable separately or interdependently, payroll, general ledger, tenant accounting, and owner accounting, the vendor said.

The package has a one-time license fee of \$20,000 and is available immediately from Whelan Associates, Inc., P.O. Box 650, Gwynedd Plaza, Spring House, Pa. 19477.

Series/1 Systems Gain 'Miis'

CAMBRIDGE, Mass. — The Meritech Interpretive Information System (Miis) medical software has been enhanced to run on IBM Series/1 computers, according to Medical Information Technology, Inc.

The product is an enhanced dialect of Mumps and features a stand-alone,

memory-resident multiuser operating system, the vendor claimed.

Miis is also supported on Digital Equipment Corp. PDP/11s and Data General Corp. Eclipse computers.

The license fee for Miis on the System/1 is \$5,000, the vendor said from 255 Bent St., Cambridge, Mass. 02141.

Runs at 1.544M Bit/Sec

Modicon Designs Local Net for Factory

By Brad Schultz
CW Staff

ANDOVER, Mass. — A local data network for factories that runs at 1.544M bit/sec for distances up to 15,000 ft and supports up to 250 devices on passive cable is available from Gould, Inc.'s Modicon division.

Called Modway, the local net system provides for layered levels of communications protocol "similar" to the emerging open system interconnection model of the International Standards Organization, a spokesman said, and "surpasses" the capabilities of Ethernet under the "harshest of factory conditions."

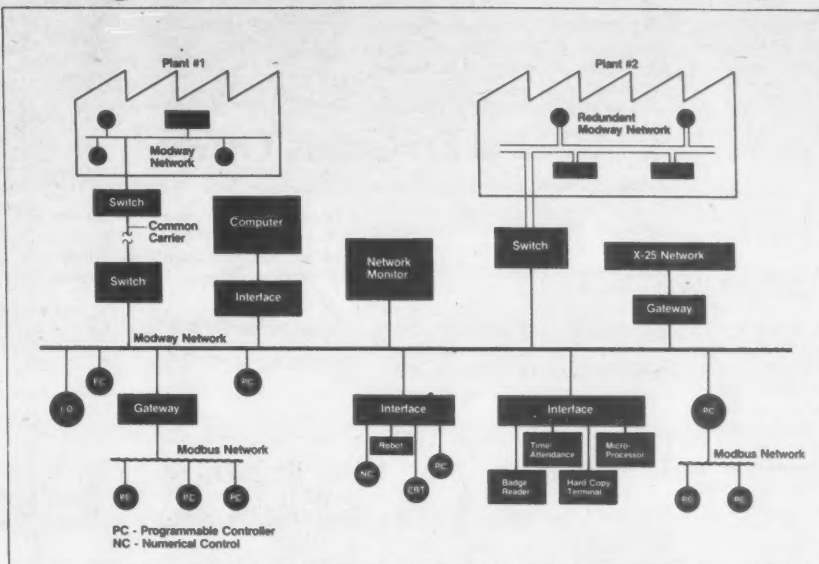
The spokesman claimed Modway will meet the expected Institute of Electrical and Electronics Engineers (IEEE) standard on local nets, although IEEE sources say the standard will specify 1M-, 5M-, 10M- and 20M bit/sec rates, compared to Ethernet's 10M bit/sec specification [CW, Dec. 1].

Modway connects programmable controllers, computer systems, CRT terminals, teleprinters, analog-digital converters, badge readers, robots, numerical control equipment, time/attendance stations and typesetting equipment among other devices a factory user might want to tie up, the spokesman indicated. These devices function as peers; Modway allows no master/slave relationships.

Hundreds Required

According to Modicon, the "plant/factory of the future" requires interconnection among hundreds of devices in a local net that can raise productivity by reducing downtime and increasing data throughput.

Toward this end, devices on the Modway system are connected to a common communications medium via "interface boxes" and channel bandwidth is time-



Modicon Modway System Configuration

division multiplexed, meaning that many data channels run at different speeds simultaneously into a single high-speed stream.

Gould's Modicon division calls its architecture for Modway the Modicon Network Architecture for Distributed Systems (Monads). This "full networking architecture" is based on the Modbus communications system and allows Modway to interconnect devices over both local and public (X.25-based) facilities.

Modway's 1.544M bit/sec transmission rate is compatible with Bell's T1 carrier system for microwave and satellite communications over public carrier facilities, the spokesman added.

"Each Modway product is user-programmable for its operational parameters," he added. Parameters can be set locally or remotely.

Unlike Ethernet, Modway grants access privileges to local net users under the token passing

scheme, whereby just one user at a time can access resources, eliminating a chance that two transmissions might collide. Token passing is favored in the UK by fans of the Cambridge Ring, now implemented by Logica VTS Ltd. [CW, March 23].

Modway pricing depends on accessories ordered. Further information is available from the Modicon division at Suite 104, 155 W. Big Beaver Road, Troy, Mich. 48064.

Working With Ma Bell: What's Your Line?

"Life With the Phone Company" will be the theme of a *Computerworld* Special Report on data communications networks appearing in June.

Edited by Senior Editor Brad Schultz, the report will feature tutorial essays and applications stories that indicate useful strate-

gies for planning and managing data communications networks around what telephone companies do to market and support links, equipment and services.

If you have something to contribute to the Special Report, please send by May 8 a manuscript no longer than six double-

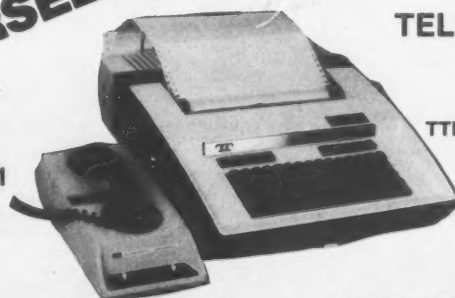
spaced typewritten pages to Schultz, Network Special Report, *Computerworld*, Box 880, 375 Cochituate Road, Framingham, Mass. 01701.

Artwork, charts and photographs for the report, which is slated to run in CW's June 29 issue, are also welcome.

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HP 3000s Get Programmable Link

SUNNYVALE, Calif. — A programmable communication interface for users of Hewlett-Packard Co. HP 3000 computer systems utilizing Multipoint Terminal Software (MTS 3000) is available from the Agile Corp.

The LC-3000 satisfies local and remote computing requirements for systems using the MTS 3000 software, the vendor claimed.

It also allows the linking of an HP 3000 communications line running MTS 3000 with a variety of otherwise noncompatible peripheral computer devices, including data terminals, line printers and others.

The product reportedly permits the

connection of any peripheral conforming to EIA RS-232C to the MTS 3000 synchronous communication line, a spokesman said.

The price for the LC-3000 is \$2,000, the vendor said from 1050 Stewart Drive, Sunnyvale, Calif. 94086.

Signal Line Protectors Offered

DEER PARK, N.Y. — A complete line of signal line protectors has been introduced by MCG Electronics, which provide interface protection for signal/data/telephone lines, protecting two-wire systems and RS-232, RS-423 and RS-422 systems.

The easy-to-install units can protect as few as two or up to a multitude of independent twisted pairs, the vendor

stated.

The Units are designed to protect signal/data/telephone lines from transient overvoltages caused by lightning, heavy machinery, elevator motors or generator.

Prices start at \$59. MCG is located at 160 Brook Ave., Deer Park, N.Y. 11729.

Muxes Offer Bisync Option

GERMANTOWN, Md. — Digital Communications Corp. (DCC) has announced that its Model CM9100 statistical multiplexer and Model SM9200 switching multiplexer now have a binary synchronous communications option.

Data channels may now be set to handle either IBM-compatible bisynchronous or asynchronous data, with the bisync option supporting point-to-point and polled terminals and Ebcidic and Ascii codes.

Both options are priced at \$250 per box and are available from Digital Communications Corp., 11717 Exploration Lane, Germantown, Md. 20767.

Option Out For CPT 8000

MINNEAPOLIS — CPT Corp. has announced the introduction of a communications option, 2770/3780 Comm 8, for the CPT 8000 word processor.

The 2770/3780 communications software feature allows the CPT 8000 to interface with mainframes and devices such as the IBM Office System 6, ink jet and laser printers and Xerox Corp. 5700 laser printer.

Batch Protocol

The 2770/3780 Comm 8 is a bisynchronous batch protocol. Information may be transmitted or received at speeds from 1,200- to 2,400 bit/sec.

The retail price for the 2770/3780 Comm 8 is \$1,500, including the communications board, cable, communications software diskette and operator's manual.

Additional communications software diskettes and operator manuals cost \$250 each.

The vendor is located at 8100 Mitchell Road, P.O. Box 295, Minneapolis, Minn. 55440.

Bus-System Extender Converts Parallel Data

SAN JOSE, Calif. — ICS Electronics Corp. has announced an IEEE-488 bus-system extender that converts parallel bus data to serial form for high-speed transmission.

The Model 4886 reportedly overcomes the 20-meter limit normally associated with 488 bus systems and allows the user to interconnect any number of widely scattered 488 bus systems into a single directed master controller, the vendor said.

Model 4886 costs \$1,295. An optional autodialing feature costs \$200, the vendor said.

ICS Electronics Corp. is located at 1620 Zanker Road, San Jose, Calif. 95112.

Transfer Switches Fit 3270-Type Terminals

GREAT NECK, N.Y. — A series of terminal transfer switches said to provide instantaneous switching between terminals, printers and IBM 3270-type systems without losing computer time to manual patch fields is available from CD Communications, Ltd.

The units are available in single 4-, 6-, and 16-switch configurations and are packaged for an office environment of banks, insurance companies and financial institutions, the vendor spokesman said.

Delivery from stock is available and prices range from less than \$100 to \$950 from CD Communications, Ltd., 15 Bond St., Great Neck, N.Y. 11021.

Your eyes, ears and



VT-100 Users Get Emulation For Graphics

SANTA CRUZ, Calif. — Selanar Corp. is offering a Tektronix, Inc. Emulation Mode Graphics option for Digital Equipment Corp. (DEC) VT-100 users. The 4010 emulation option to the firm's Graphics 100 product allows VT-100 users to display graphics data at a substantial savings, Selanar claimed.

The Graphics 100 feature will fit any VT-100 series CRT terminal and does not require a tube change. It is installed by sliding the card into the card cage and connecting the power and signal cables.

A light pen option is also available. For non-Tektronix users, a software



DEC VT-100 With Selanar Light Pen

package, PL100, is provided to support the Graphics 100 in Fortran applications.

The Graphics 100 costs \$1,200, the Tektronix option is \$250 and the light pen is \$450, in addition to the Graphics 100 price. PL100 software costs \$600. A complete graphics system is available for \$3,250 from the firm at 2403 De La Cruz Blvd., Santa Cruz, Calif. 95050.

Dial-Up, Voice-Output Unit Offered IBM Mainframes

WINCHESTER, Mass. — A telephone input/voice output communications front end for IBM mainframes is being introduced by Perception Technology Corp., which claims the system can provide 24-hour access while reducing the need for computer operators.

The PTC Vocom-1 CFE was designed as a voice-responsive interactive communications front end that permits data input and retrieval from IBM mainframes over standard Touch-Tone telephones. The company says the system emulates the IBM 3271 protocol and requires no special customer software. Tasks run under CICS.

The system provides four channels in

its basic configuration, expandable to 32. Hardware is an adaptation of the PTC BT-2, a Digital Equipment Corp. (DEC) PDP-11-based voice-response processor that uses digitized human speech stored in memory. Applications reportedly include order entry, remote data collection, status inquiry, credit authorization and security.

The system is available for \$37,450 from Perception Technology Corp., 95 Cross St., Winchester, Mass. 01890.

UDS Adds Set To LP Series

HUNTSVILLE, Ala. — A direct-connect modem capable of full-duplex operation at 300 bit/sec and providing automatic answer service has been added to Universal Data Systems' LP series of telephone line-powered units.

The UDS 103J LP utilizes a manual switch on the unit's backpanel to select either Originate or Answer frequency pairs. Regardless of how the switch is set, the modem will automatically answer incoming data calls in the answer mode when the front panel selector is set to Data.

A front panel selector allows the user to choose between ordinary voice conversations and data communications.

The UDS 103J costs \$245 from the firm at 5000 Bradford Drive, Huntsville, Ala. 35805.

Edit Buffer Out For AJ 880 Unit

SAN JOSE, Calif. — Anderson Jacobson, Inc. has introduced a 16K Editing Buffer Option (EBO) for its AJ 880 general-purpose terminal.

The EBO allows the terminal to perform interactive applications, including remote job entry, data logging, program loading and debugging, data inquiry, text editing, store and forward and transaction processing.

Designed as a storage unit with send and receive buffer, the EBO permits off-line storage, editing and data formatting with block or line-at-a-time transmission at up to 1,200 bit/sec. It also stores incoming data received at high speed for editing or reformatting before printing or retransmission.

The EBO may be leased for \$50/mo or purchased for \$995, with lower pricing available in larger quantities. The vendor is located at 521 Chaucer Ave., San Jose, Calif. 95131.

Rixon RM70 Supports Mixed Card Modems

SILVER SPRING, Md. — Rixon, Inc. has announced the RM70 Rack Mount Unit, which can intermix its asynchronous and synchronous limited-distance card modems in any combination.

The RM70 has a capacity for up to 16 Rixon LDM710-L1 or up to eight synchronous LDM720-L1 Card Limited Distance Modems. It can be configured as a 90- or 23-in. mounting.

The list price of the RM70 is \$295, the vendor said from 2120 Industrial Parkway, Silver Spring, Md. 20904.

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TP-212 Mixes Terminals

SIMI VALLEY, Calif. — A data distributor designed to be used with networks using asynchronous terminals or a mix of synchronous and asynchronous terminals is available from Teleprocessing Products, Inc.

The TP-212 allows connection of two asynchronous terminals to a synchronous modem or to one or more ports of a multipoint synchronous modem.

The unit may, for instance, be used to provide two 1,200 bit/sec data paths over a 2,400 bit/sec modem, the vendor claimed; this capability can be extended up to eight 1,200 bit/sec paths over a multipoint 9,600 bit/sec modem.

The product costs \$1,120. More information is available from the vendor at 4565 E. Industrial St., Building 7K, Simi Valley, Calif. 93063.

Built-in Data Concentrator

Micro8000 Line Gets Multidrop

CHATSWORTH, Calif. — Micom Systems, Inc. has added new multidropped models to its Micro8000 Concentrator Modem, a high-speed modem series which includes a built-in data concentrator and automatic retransmission-on-error.

Suited to the minicomputer user with two or more terminals in offices remote from the computer, the Micro8000 op-

erates as a multidropped cluster controller with built-in modem. Operating on Digital Equipment Corp., Data General Corp., Hewlett-Packard Co. and other minicomputer systems, it requires no special polling software and operates with low-cost dumb terminals on multipoint telephone lines, the vendor said.

Operating at 2,400- or 4,800 bit/sec, the multidrop Mi-

cro8000 modems permit up to 16 asynchronous data terminals to share the line, multidropped in up to eight different locations.

Costs for the Micro8000 range from \$1,750 for a 2,400 bit/sec modem with built-in 2-channel concentrator to \$7,100 for a 4,800 bit/sec modem with built-in 16-channel concentrator. Micom is at 9551 Irondale Ave., Chatsworth, Calif. 91311.

Modem Offers Originate Mode At 300 Bit/Sec

MORTON GROVE, Ill. — A combination telephone and modem reportedly providing an originate-mode Bell 103/113-compatible 300 bit/sec modem combined with a push-button telephone is available from Comdata, Inc.

The Model 370E2-42 Phonem has voice/data modes controlled automatically by lifting or replacing the handset, automatic redial and automatic answering and disconnecting of data calls. LED indicators display status of ring, terminal ready off hook, carrier, data and answer mode, the vendor claimed.

The Phonem 370E2-42 is available from stock and priced at \$327 from Comdata, 7900 N. Nagle, Morton Grove, Ill. 60053.

NCR Comten X.25 OK'd for Telenet

ST. PAUL, Minn. — GTE Telenet Communications Corp. has announced acceptance and certification of the NCR Comten, Inc. X.25 interface to the GTE Telenet public data network.

Users now can attach their terminals to the GTE Telenet network and terminate them at a Comten front-end processor connected to IBM or IBM-compatible hosts, a spokesman said.

NCR Comten is located at 7200 Snelling Ave. N., St. Paul, Minn. 55113.

Telegenix Offers Large Display

CHERRY HILL, N.J. — A large-screen data display system has been announced by Telegenix, Inc., a New Jersey-based supplier of communications products.

The system is designed for high-resolution video displays of alphanumeric and graphics information for computer-generated signals.

Single-unit price for the system is \$4,500.

The vendor is located at 26 Olney Ave., Cherry Hill, N.J. 08003.

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Morrow Designs' 10 megabyte hard disk system: \$3,695.

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Sausalito, CA, (415) 332-4443, offers a CP/M expanded to full Cromemco CDOS compatibility.

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The Z19 is ideal for high speed data entry. The 12" diagonal CRT gives you a crisp, clear video image. And the Z19's keyboard follows the standard typewriter keyboard layout for operator ease. Along with this you get ANSI and DEC®-VT52 compatibility. And one other DEC is a registered trademark of Digital Equipment Company.

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Toes Adds Alpha-Tone

ST. LOUIS — Interface Technology, Inc. has announced Alpha-Tone, a portable, battery-operated terminal that offers a 40-key alphanumeric keypad and an acoustic coupler.

The terminal was developed for Interface Technology's Touch-Talk Order Entry System (Toes), but it adds alphabetic characters to the previously numeric-only system,



Alpha Tone

the vendor said.

The terminals cost \$250, the vendor added.

Interface Technology may be reached through P.O. Box 21558, 10500 Kahlmeyer Drive, St. Louis, Mo. 63132.

System Offers Fiber Optics

PORT WASHINGTON, N.Y. — Math Associates, Inc. has announced a fiber-optic transmission system called the XR-1000.

The package is RS-232C-compatible and runs in simplex of full-duplex asynchronous modes.

The XR-1000 costs \$975, the vendor said from 6 Manhasset Ave., Port Washington, N.Y. 11050.

Complex Systems' Chips Adds Other Functions

NEW YORK — A clearinghouse interbank payment system (Chips) which reportedly performs all the functions necessary to automate clearinghouse paying and receiving processes has been developed by Complex Systems, Inc.

In addition to meeting Chips requirements, the Funds Transfer System (FTS) '81, performs other functions of a

non-Chips nature, allowing automation of a major part of a paying and receiving department.

It also keeps on-line updates of customers' demand deposit accounting (DDA) positions, generates interfaces and records to DDA, general ledger, loans, foreign exchange and Telex and produces Chips-related and MIS reports.

Based on IBM hardware, FTS '81 is designed to interface the existing Chips system on single or multiple lines using either an asynchronous discipline at 1,200 bit/sec or a binary synchronous protocol at 2,400 bit/sec (4,800 and 9,600 bit/sec are available).

FTS '81 functions are grouped into on-line paying/receiving operations; end-of-day batch processing and maintenance and support utilities. The on-line subsystem provides communications between the clearinghouse and the IBM Series/1. The End-of-Day subsystem purges files of daily messages, files these on a history tape and produces files to interface financial systems for night update and/or reconciliation and to produce management reports.

The FTS '81 system is available for a one-time license fee starting at \$80,000.

The vendor is located at 475 Park Ave. S., New York, N.Y. 10016.

Rav Builds Chips Unit

NEW YORK — Rav Communications, Inc. has unveiled a turnkey computer system designed to automatically control the vendor's clearinghouse interbank payment system (Chips).

The Rav/Chips module permits payment input even when the clearinghouse is not in operation, minimizing delay due to terminal response time, the vendor claimed.

Other features include a capability for simultaneous processing of stores (sends) and receives, single-field correction, a separate Rav/Com microprocessor to relieve the CPU of protocol handling and one-step printing upon completion of transaction operations.

The system is composed of all-Texas Instruments, Inc. hardware, including a Model 990/2 minicomputer with dual 1.15M-byte floppy disks; two Model 810 printers and a Model 820 terminal and up to three intelligent CRT terminals.

The price for the system is \$60,000, the vendor said from 90 West St., New York, N.Y. 10006.



PRICE/PERFORMANCE BREAKTHROUGH EARNS 'BEST BUY' RATING FOR NEW DIGI-LOG DLM III DATA LINE MONITOR

'Best Buy'... a provocative claim that pricks the mind for proof. 'Price/Performance Breakthrough'... awaited news of fact? or shabby boast? Consider the facts yourself.

Before printing our claim, we checked and compared the competitive position of each one of DLM III's performance specifications (see listed highlights). We also examined the product intangibles such as lightweight portability, easy set-up via CRT guided instructions, and rugged dependability. We considered Digi-Log's seven year record as a successful data comm test equipment supplier. We then compared DLM III's low price. No other data line monitor rating approached the new DLM III for value.

A portable, self-contained DLM III is rated a Best Buy for field use because it is compact, easy-to-use, and inexpensive enough to be a practical field service tool.

DLM III even tests itself, and with the interactive option, it can simulate terminals or modems and check the line with a BERT test.

Feature Highlights	DLM III
8K Data Storage	✓
Bit and Byte Protocols	✓
Menu Set-Up	✓
Programmable Trap	✓
EIA RS 232C Breakout	✓
Speed to 19.2 kb	✓
Printer Output	✓
On Line CRC/LRC	✓
Idle Suppression	✓
Lightweight: 17 pounds	✓
Price	\$3190*
Interactive Capability including BERT Test	\$585

A rack-mounted DLM III is a Best Buy for central site use because it is compatible with all the modern protocols, and it offers the features you need for effective network monitoring at a far lower price. In the central site comm center, the new DLM III is an excellent companion to Digi-Log's Network Supervisory System.™

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Bits & Pieces

Dual-Function Serial Printer Utilizes 40 by 80 Matrix Array

KENT, Wash. — Mannesmann Tally has announced a dual-function serial printer that produces letter-quality characters via a 40 by 80 matrix array technique.

Called the T-1805, the printer can operate in either word processing (low-speed) or data processing (high-speed) modes. It prints up to 200 char./sec with optimized bi-directional printing, the vendor said.

The T-1805 costs \$2,495. Mannesmann Tally is at 8301 S. 180th, Kent, Wash. 98031.

Ampex Hikes Prices 5% On DM Disk Drive Series

REDWOOD CITY, Calif. — Ampex Corp. has announced a 5% increase for its line of disk drives effective May 1.

The company said the price increase has been instituted to recover increased labor and materials costs.

It affects the Ampex DM series of disk drives, ranging in capacity from 40M bytes to 300M bytes. The vendor is located at 401 Broadway, Redwood City, Calif. 94063.

On-Line Interactive System Composes Repetitive Letters

TREVOSE, Pa. — Neshaminy Valley Information Processing, Inc. has announced an on-line letter writing system that can interactively compose unique or repetitive business letters.

Features include the ability to select multiple paragraphs from a file and combine them with free-form paragraphs support for IBM's DOS/VS, OS/VS and MVS.

The system costs \$16,500 with a \$1,500 installation fee. NVIP is at 4850 Street Road, Trevose, Pa. 19049.

EDP Auditors Quarterly Debut To Feature Industry Listings

CHICAGO RIDGE, Ill. — EDP Audit Associates, Inc. will publish the first issue of a quarterly called the *EDP Auditors Digest* June 30.

The issue will feature lists of textbooks, research reports, handbooks and original and reprint articles on information systems auditing as well as a calendar of upcoming EDP audit workshops.

Single copies cost \$9.95 and a year's subscription runs at \$36. Copies are available from EDP Audit Associates, Inc., P.O. Box 255, Chicago Ridge, Ill. 60415.

Oldest Calif. Firm Finds Youth in PCM Market

Special to CW

LOS ANGELES — California's oldest corporation abandoned its overburdened IBM mainframe two years ago in favor of a plug-compatible manufacturer's (PCM) machine. Since then, the system has been working nonstop without any downtime despite an increasing workload — and the equipment-shaking rumblings of passing railroad trains.

Ducommun, Inc., a large-volume distributor of both electronics components and raw industrial metals, replaced its IBM 370/155-based inventory control system with a National Advanced Systems (NAS) AS/6 computer. The processor was originally purchased from Intel Corp., but is now supported by NAS following the transfer of Intel's Data Products Group to that firm.

The AS/6 was installed over a weekend, without any software changes, and now feeds the company's inventory and pricing information to about 300 terminals scattered

across the country. In fact, the computer has been working so well that Ducommun added a second system — a NAS AS/7000N — last November.

Ducommun originally bought the AS/6 because it was highly competitive cost-wise, Bill Congleton, the company's vice-president for management information systems (MIS) operations, said.

"Configured to do the job, an IBM 3031 would have cost us an additional 30%, and Amdahl Corp.'s Model 470V/5 would have cost an additional 10%," Congleton explained. "Amdahl apparently lacked the expertise to do it, and IBM was not too flexible in the matter of trade-ins," he added.

Instruction Speed

Ducommun's AS/6 has 4M bytes of main memory and operates at about 3.3 million instructions per second (Mips), which is nearly five times the speed of the old IBM

(Continued on Page 88)

Future Systems — Part 4

DDP's Wide Appeal Spreads With Both Successes, Failures

By Frederic G. Withington

Special to CW

CAMBRIDGE, Mass. — Like the circus, distributed data processing (DDP) appeals to a variety of people for an even greater variety of reasons. However, DDP experiments within the educational, scientific and business communities have produced both successes and three-ring failures.

Based on these successful and not-so-successful case histories, it can be said that DDP is capable of providing three classes of data processing environments:

- Completely independent applications, where each user implements his own, and sharing is arranged informally. Arpanet is the prototype of this network class.

- Local portions of centralized applications, where the local equipment does all it can, reducing the role of the central system and communications with it to a minimum. Such a network is hierarchical, rather than fully distributed, because it still depends on a monolithic general-purpose machine at the center. But, it does provide a substantial part

of the potential benefits of DDP.

- Single applications, where the files can be segmented. These include such applications as hotel reservations and banking, or

In the final installment of this four-part series on future computer systems, Frederic G. Withington probes the ins and outs of distributed data processing and explains why the pot of gold at the end of the rainbow may not be as full as the user initially thinks.

where a branch keeps individual records or files.

However, distributed computer networks have proved unable to provide two other classes of environments:

- The large-scale computational facility needed for extensive mathematical work or for high-volume batch processing runs. A user can, of course, arrange for the connection of his local system to a very large re-

(Continued on Page 85)

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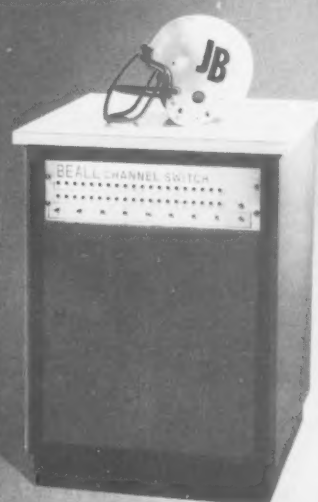
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Disk Storage Units Out

TRUMBELL, Conn. — Bunker Ramo Corp.'s Information Systems Division has developed a dual-sided Disk Storage Unit (DSU) which reportedly offers double the storage capacity of its current unit.

The Bank Control System 90 DSUs are designed primarily for storage of banking transaction data entered through the system's teller and administrative terminals and automated teller machines. The new DSU Model 90/82B (first drive) and optional 90/82C (second drive) provides storage capacity of 500K bytes per drive.

System 90 transactions and program data are recorded in the DSU onto single-sided or dual-sided IBM-compatible diskettes. Both

types of floppy diskettes store approximately 250,000 characters per side on 73 usable tracks, each containing 26 128-byte sectors.

Each dual-sided DSU is connected to a Bunker Ramo System 90 Programmable Control Unit (PCU) through a high-performance disk storage controller. Two such controllers, with a maximum of two disk drives connected to each, will provide 1M byte of storage per controller.

The list price for the DSU Model 90/82B is in the \$2,600 range. With the optional 90/82C, the cost is approximately \$4,300. Quantity discounts are available. Bunker Ramo said from 35 Nutmeg Drive, Trumbull, Conn. 06609.

Add-In Boards Fit VAX-11/780

DALLAS — A series of high-density, high-speed add-in modules said to be hardware- and software-compatible with the Digital Equipment Corp. VAX-11/780 processor has been announced by Texas Instruments, Inc.

The TMM30000 series boards offer 512K, 768K or 1M byte of memory per board.

One of these boards may be used in place of two to four VAX M8210 memory boards, the vendor spokesman claimed.

The modules, depending on memory, are priced from \$4,700 to \$9,000 and are available from Texas Instruments, Inc., P.O. Box 202129, Dallas, Texas 75220.

Printers Priced Under \$750

ALLSTON, Mass. — Capitol Circuits Corp. has introduced four printers, all priced under \$750.

The Model 100 Impact Mini-Printer is a 27 column unidirectional two-color print station, which prints at a continuous rate of 2.4 line/sec. Consisting of a dot matrix print mechanism, control electronics, proprietary power supply and industry standard 3-in.-wide adding machine tape, the unit offers serial RS-232C and 20mA current loop or byte parallel transmission interfaces.

A variety of software commands are user available for format control, in the Model 100, which is priced at \$545.

Print Station

The Model 400T is a 40-column bidirectional print station which prints in a 40-column format at a continuous rate of 3 line/sec.

When used with industry standard two ply 3.5-in. wide roll stock, the unit provides a receipt and a stored journal. A single line validation slot is available for check validations with the Model 400T which costs from \$735 to \$750.

The Model 400 Document/Slip Printer is a 40-column bidirectional print station which prints at a continuous rate of three line/sec. An open throat design allows the user to print on any size document/slip. The 96 Ascii character set is printable in a 5 by 7 dot matrix format. The Model 400 costs \$775.

The firm's Model 270 Document/Slip Printer is a 27-column unidirectional print station which prints at a continuous rate of 2.4 line/sec.

The open throat design allows the user to print on any size document/slip and has a 96 Ascii character set which is printable in a 5 by 7 dot matrix format. A variety of software commands are user available for format control. The Model 270 costs \$670.

Capitol Circuits Corp. is located at 24 Denby Road, Allston, Mass. 02134.

Off-Line Device Tests Disks

ORANGE, Calif. — An off-line tester for use with all disk drives with the storage module interface and for Winchester 8-in. or 14-in. drives has been announced by Wilson Laboratories, Inc.

The SX-530 Disk Memory Exerciser is a tester that locates both permanent and intermittent errors. It reads and writes data in four formatted modes using a selection of three fixed data patterns and one programmable pattern.

Error indicators show the type and location of errors. Controls permit setting the SX-530 to override errors, or to stop on error.

The unit price of the SX-530 is \$2,250, including a crystal controlled clock for data timing, an integral power supply with over-voltage protection, tester-to-drive cables and an operating manual.

The price also includes the interface, except for the Ansi version, which costs \$150 more.

The vendor is located at 2237 North Batavia St., Orange, Calif. 92655.

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DDP's Appeal Persists With Success, Failure

(Continued from Page 83)

remote computer for operation in the remote batch mode, but the resulting arrangement is hierarchical and subject to the congestion, overhead and uncertain service associated with use of a centralized general-purpose system.

• For complex applications whose files cannot be completely segmented. For instance, airline reservation systems must display identical records of rapidly changing information to all terminals, but no way has been found to distribute such a file cost-effectively.

No Panacea

Users of distributed computer networks have also found that the hoped-for economy and freedom is not always achievable.

Costs are not always as low as hoped. If the local computer is to be versatile and itself support multiple modes of use (batch, time-sharing and perhaps transaction processing), it cannot be below a certain size. It must have a large memory to contain the necessary systems programs and probably an extensive complement of peripherals. It typically turns out to cost \$50,000 to \$100,000; it is much more than a "simple minicomputer."

In fact, total equipment costs usually turn out to be about the same between a central general-purpose computer and distributed smaller systems. The small systems gain in computer power per dollar, but lose in total peripheral equipment costs where the larger devices still offer economy of scale. And in addition to equipment costs there are operator salaries, site preparation and media costs.

Users of distributed computer networks have also rarely found the complete freedom they have hoped for. If they want to intercommunicate, they must abide by common communications standards. If they want to use one another's machines, they must abide by common programming language and configuration standards or use identical systems from a common manufacturer. If the applications they develop are to be understood by others for their own use or for modification and maintenance, the applications must be prepared and documented in meticulous conformity with common standards.

The proponents of a network that is to provide all these services — intercommunications, equipment sharing and application sharing — find themselves with a more difficult management problem than they had with centralized general-purpose systems, where users were automatically constrained by its standards.

This is only meant to point out that distributed networks are not a panacea. In fact, the dominance of the large central processor will be steadily eroded as more and more users adopt distributed computer networks for the applications they are able to handle.

The bottom line is that it appears both hierarchical and distributed networks will continue to be used in the future. The hierarchical structure applies when the applications involve interaction with a central data base.

A large system maintains the central file and all transactions are processed against it. Networks of terminals located at the points of transaction connect

to the system, probably with data concentrators employing minicomputers to reduce line costs. The terminals themselves are likely to have internal processing capability for editing of internal data, assisting operators in following procedures correctly and generally performing whatever operations on the data can conveniently be done locally without access to the central data base.

Carrying this principle further, hierarchical networks will apparently also include satellite processors with file handling capability. Often a local office, plant or warehouse will have files of data unique to it — the local payroll or customer and facility records needed only locally. Usually it proves most economical to keep these files on site, and use a small computer both to process them and to serve as a terminal for the central system.

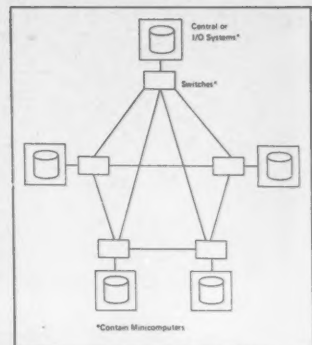
Such a satellite often spends the bulk of its time doing local processing, but during a crucial fraction of the time it is providing data for the central system and receiving instructions and sched-

ules from it. The relationship is therefore still hierarchical.

If there is no need for a central data base (as in a conglomerate organization where each division is in a different business), the situation is different. Interconnection is still needed for sharing computational workloads and exchanging the smaller amounts of data which require interdivisional transmission, but each division's system is self-sufficient and maintains its own files. The network will consist of interconnections between the distributed divisional systems.

The ubiquitous minicomputer is employed at each node of the distributed network as a switching device for data or text being transmitted. It may be provided with file storage capability for temporary retention of information passing through, but this is small compared with that of the local central computer to which it is connected.

Of course, the local installation need not be a central system. A group of terminals connected to a concentrator can equally well be attached to a node in



Distributed Network

the loop, with minicomputers again employed in them. If such arrangements exist, the resulting network is a hybrid of the hierarchical and the distributed.

Withington is vice-president of the Information Systems Group at Arthur D. Little, Inc., headquartered in Cambridge, Mass.

No Revolution Seen Soon for Office

By Frederic G. Withington
Special to CW

There are several forces in the office environment that imply there will be no overnight revolution.

For one thing, most office workers deal with multiple intermixed media. People need data and they read and write text, but what they mostly do is talk. Also, almost everybody deals with graphics images, some of the time at least. Even the president of a company, some time during his working day, will be looking at a picture of a product, an advertising brochure or a graph, chart or drawing. If new systems are going to meet the needs of the office environment, they are going to have to intermix voice, graphics, text and data in the appropriate ways to meet people's working patterns.

Everybody agrees on the need to enhance office productivity, but only in acceptable ways. Most people are reluctant to change their working habits, particularly if in doing so they must learn complex operating procedures for new machines. Interpersonal working rela-

tionships must usually be retained, and traditional modes of assistance: the chairman of the board is likely to be unwilling to type all his correspondence into a keyboard. In some offices, it's possible to dedicate specialists to operating word processing machines all day long. In most offices, it is not; it has been tried.

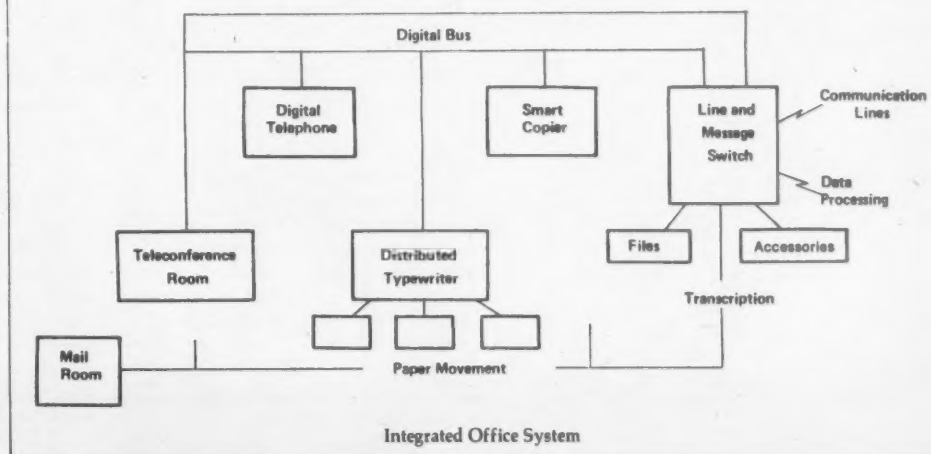
Office systems must also be easy to use: as a rule of thumb, they should be about as convenient to operate as the convenience copier. Also, office automation should not be job-threatening; few employers like the idea of massive layoffs. Many Europeans are convinced there will be substantial reductions in clerical and factory jobs soon because of microprocessors. In the U.S. the feeling is not so strong, but it is present and if layoffs start to actually happen, public hostility will surely develop. Productivity enhancement, which simplistically means firing a lot of people, must not happen that way.

There is not likely to be a sudden revolution in the office. But office automation must come. Paperwork

burdens and costs are obviously increasing at an unacceptable rate. What in fact will probably be happening in the next few years is not the appearance of massive integrated office systems, but of certain specific products that do not impact behavior heavily and which are obviously productivity enhancers.

Three products that will impact the office automation area are the distributed typewriter, which is basically a minicomputer-controlled multiterminal word processor system; the smart copier, which could be a printer for the distributed typewriter and even a facsimile transceiver; and the display telephone, which can be used for electronic mail, to access public data bases and even store information.

In the wonderfully rich spectrum of possible products such as these three, there may be a hundred other possibilities for things that will sell relatively soon, which can be easily developed and supported, and which the big companies don't happen to think of or which don't fit their strategy.



Integrated Office System



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- Doctors who are using microprocessors to improve the lives of diabetics.
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- Privacy experts who are trying to prevent computers from creating a "big brother" society.
- The psychologist who uses computers to study criminal behavior.
- DP experts in banks whose techniques are doing to paper money what money did to the barter economy.
- Computer people in business who have used computers creatively to improve their businesses — or to create whole new ones.
- Weather experts who use computers vs. the Old Farmer's Almanac.

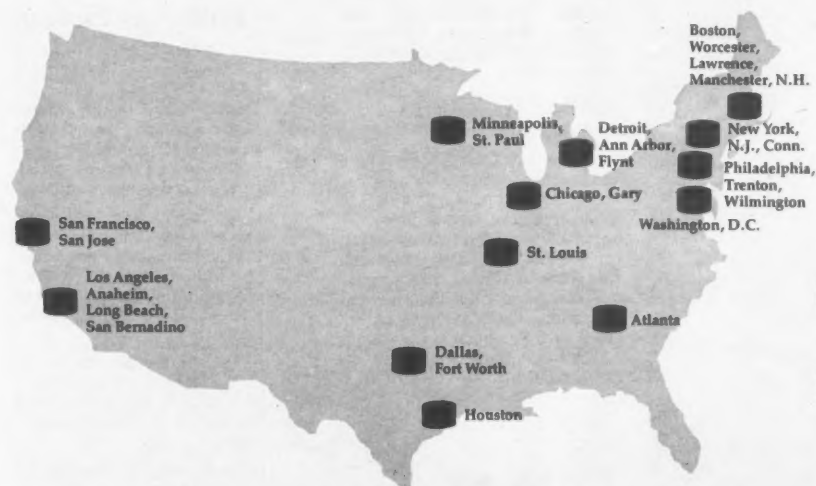
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Oldest Calif. Firm Finds Youth in PCM Market

(Continued from Page 83) processor, the M15 vice-president said. The AS/7000 has the same amount of memory, but is configured to operate at 2.2 Mips, which is reportedly the machine's lowest performance level.

The second system's power capacity is muffled because the computer is basically used for program development and as reserve computing power, according to Congleton.

But when the time comes, the AS/7000N can be field-upgraded to the 3.3 Mips AS/7000 and again to the 5.5 Mips AS/7000 Dual Processor Complex (DPC).

The problem with the IBM mainframe was that it kept the firm's sales force waiting too long for answers about inventory or pricing. Even worse, the company's ability to expand and open new offices was severely hampered by the

slow machine, Congleton pointed out.

More than 40,000 line items are carried by Ducommun's metals company, while more than 80,000 items are listed by Kierulff Electronics, the firm's OEM electronics parts distributor subsidiary. In addition, products are warehoused at 30 different locations and require about 5G bytes of disk storage to contain their master records.

It takes 18 spindles of 317M bytes each to hold Ducommun's data base for the two operating companies. There are four 200M-byte removable spindles as well. Eight 6,250 bit/in. tape drives handle the firm's various financial, reporting and other miscellaneous applications. There are two line printers, some older punched card equipment and a highly advanced, 9,600 bit/sec communications net-

work that drives 300 terminals all over the country.

Operating at .7 Mips, the 370/155 could not meet the demands of such a vast system, and potential customers faced extended waiting periods.

Of the three mainframe finalists — IBM, Amdahl and NAS — the Advanced System unit proved to be the most cost-effective solution, Congleton observed.



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Weekend Installation

"Without altering a line of code or missing a beat, we closed for business Friday, removed the IBM 370/155, installed the Advanced System, powered it up, loaded the programs, booted the system and opened for business on Monday morning as if nothing had happened — except that the salespeople's terminals responded as soon as they removed their finger from the RETURN key," Congleton recounts.

Now, once a Ducommun salesperson has advised the customer of price and assured the data of delivery, the order is taken, entered into the terminal and, within a minute, a packing slip is printed in the appropriate warehouse.

The new mainframe has helped the firm increase sales while holding down inventory growth. More importantly, however, the firm hopes to pay back the entire cost of the two computers within five years or less, Congleton said.

And, of course, both computers continue running despite the fact that constantly passing railroad trains send waves of small earthquakes through the building.

Print Formatter Enhances Output

ATLANTA — Technical Analysis Corp. has unveiled its PF/2A Print Formatter, designed to utilize the plotting capability of the Okidata Corp. SL125 and SL250 printers to create a range of special- and general-purpose output.

Bar codes, variable size and aspect ratio characters, product and corporate logos, variable forms layouts and complex label printing are examples of the capabilities, the vendor claimed.

The PF/2A accepts serial, asynchronous RS-232C Ascii input and provides parallel output to the Okidata printers.

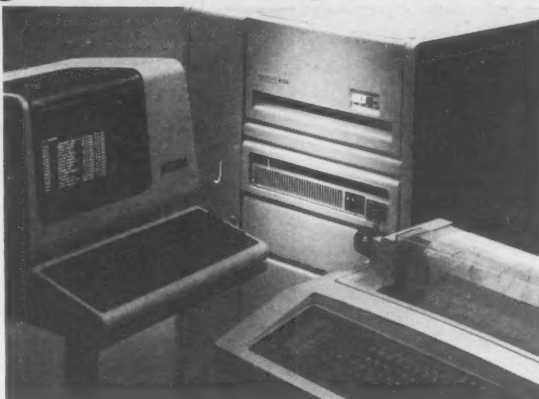
Characters may be expanded independently in both horizontal and vertical dimensions, italicized, printed in half-tones, white or black.

The product costs \$2,295, the vendor said from 120 W. Wieuca Road, N.E., Atlanta, Ga. 30042.

DEC Brings Out Entry-Level PDP-11

MAYNARD, Mass. — Digital Equipment Corp. has unveiled an entry-level member of its PDP-11 computer family that is said to have 90% the integer performance and four times the memory expansion of the firm's low-end PDP-11/34A minicomputer.

The PDP-11/24 general-purpose minicomputer was designed to complement the firm's upper mid-range PDP-11/44 system and features such architectural standards as MOS/LSI technology and DEC's Unibus structure. Memory on the 11/24 can be expanded at a 25% to 30% lower cost than that of the 11/34A, which was introduced about five years ago. In fact, the recent PDP-11 addition, with a price tag starting at about \$11,000, is DEC's lowest priced minicomputer with megabyte memory ca-



DEC's PDP-11/24

capacity, a spokesman said.

The PDP-11/24 employs a single hex-height CPU, the ex-

tended PDP-11 instruction set and the memory addressing extension previously available only on the PDP-11/44 and DEC's top-of-the-line PDP-11/70. Optional features include a floating-point instruction set, 22-bit extended addressing capabilities for memory expansion to 1Mi byte and battery backup.

The 11/24 is currently available in three packaged configurations that run under DEC's RT-11, RSX-11 and RSTS/E operating

systems. The processor is also offered in four commercially oriented DEC Datasystems that run under the CTS-300 and CTS-500 operating systems, the spokesman continued.

The three packaged systems consist of a processor with 128K bytes of memory, dual RX02 floppy disk drives and either a Decwriter IV hard-copy terminal or VT100 CRT terminal; a processor with 256K bytes of memory, dual RL02 10.4M-byte disks and a choice of the VT100 terminal or Decwriter III printing terminal; or a processor with 256K bytes of memory, dual 28M-byte RK07 disk drives and a Decwriter III terminal.

All of the packaged systems utilize the full spectrum of DEC software products, including Basic, Fortran and Cobol compilers, communications packages and data management packages. Packaged system prices start from \$19,800 with software.

Four Systems

The four PDP-11/24-based Datasystems are the models 346, 348, 522 and 528A and E. The Datasystem 346 and 348 series use the CTS-300 operating system. (Continued on Page 90)

Desktop System Offers Large Storage Capacity

HARTFORD, Wis. — General Robotics Corp. has introduced a microprocessor-based desktop computer system that is said to have more floppy disk storage capacity than competing small business systems.

The Scorpio system incorporates Digital Equipment Corp.'s LS-11/2 microcomputer and has 64K bytes of memory.

The system also has General Robotics' DLV11 serial I/O interface and two double-sided double-density minifloppy disk drives and controller, a spokesman said.

Increased Capacity

However, unlike DEC's competing RX02 floppy disk system, which has about 1M byte of available floppy storage space, the Scorpio boasts 1.8M bytes of storage, a spokesman explained.

The minifloppy disk features an average access time of 177 msec, a .25-sec start-up time, and a 3-msec track-to-track step rate. Also, the disk drive features a read mechanism that is said to increase disk life and ensure greater reliability.

The system costs about \$7,000, or under \$4,000 in large quantities, from the firm at 57 N. Main St., Hartford, Wis. 53027.

Xylogics System Uses DEC Parts

BURLINGTON, Mass.—Xylogics, Inc. has announced a general-purpose packaged computer system that incorporates its Winchester disk and tape cartridge subsystems with a Digital Equipment Corp. microprocessor, memory and communications ports.

The XL2300 is based on DEC's LS-11/23 microprocessor and runs all DEC operating systems, including RT-11, RSX-11M and RSTS/E and is compatible with all of that firm's software. In addition, the system supports third-party software not previously available on the DEC computer, such as Taps, Word-11 and Unix.

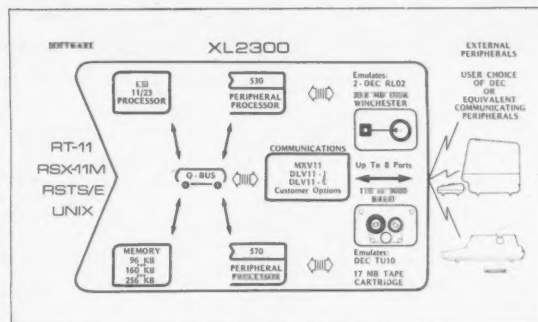
The packaged computer is Xylogics' first entry into the general-purpose packaged systems business, a spokesman said.

The XL2300 system has from 96K to 256K bytes of random ac-

cess memory; up to 24M bytes of 8-in. Winchester disk storage with full DEC RL02 emulation; a 17M-byte 3M Co. tape cartridge subsystem with full TU-10 emulation and error checking; up to eight DL-11, RS-232 communications ports; a 12-slot back-

plane that is identical to DEC's Q-Bus; and a power supply.

The unit is available as a tabletop system or rack-mountable computer. The system costs from \$22,500 with OEM discounts offered by Xylogics at 42 Third Ave., Burlington, Mass. 01803.



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CW 3/30

Floppy System Fits LSI-11

OTTAWA — Dynalogic Corp. is offering the Dynastor Model 8202 floppy diskette subsystem, which it said is fully software-, hardware- and media-compatible with Digital Equipment Corp.'s LSI-11 microcomputer.

The Model 8202 replaces DEC's RXV21 floppy diskette subsystem, being fully compatible with the RXV21 register definition and command protocol and capable of operating, with no modification, with operating systems and diagnostics designed for the RXV21.

The Model 8202 was designed for high reliability in adverse environments and its subsystem includes controller electronics that are mounted on a single dual-height card that plugs directly into any standard LSI-11, LSI-11/2 or LSI-11/23 Q-bus slot, the

firm said.

The Model 8202 costs \$3,595 from Dynalogic at 141 Bentley Ave., Ottawa, Ont., Canada K2E 6T7.

'Information on Tap' Offered to Vendors

PARSONS, Kan. — Universal Beverage Systems, Inc. has announced a turnkey system for small beer and soft drink distributors called Information on Tap.

The package is designed for use with an IBM 5110 or 5120 desktop computer system. The programs are written in Basic and can be custom-tailored to the user's needs, the vendor said.

The turnkey package costs \$20,000. The vendor may be reached through P.O. Box 1015, Parsons, Kan. 67357.

CAD/CAM System Works Type, Design Engraving

CAMBRIDGE, Mass. — The Microtex 8200 computer-aided design and manufacturing (CAD/CAM) system introduced by Microtex offers increased productivity in the numerically controlled engraving of individual type and composed graphics designs and in milling of molds and dies.

The complete turnkey 8200 combines traditional job functions into a full-color, computer graphics workstation, according to the firm.

The system consists of a 16-bit microprocessor system, up to 256K bytes of memory, 40M bytes of on-line disk storage, color graphics station and an operating system and applications software for \$85,000 from the firm at

80 Trowbridge St., Cambridge, Mass. 02138.

Newspapers Get Library System

BEDFORD, Mass. — An on-line interactive, full-text library system for newspapers and other publishers is available from Atex, Inc. and Infotex Associates, Inc.

Using the system, the user can search through the entire data base using any word or phrase and can then display the full text of stories selected, the vendor said.

The basic system includes the Digital Equipment Corp. PDP-11/34 CPU with attached Atex proprietary hardware, a Kennedy, Inc. magnetic tape unit and two 300M-byte Control Data Corp. disk drives.

The system price ranges from \$200,000 to about \$400,000, depending on options selected and system configuration from Atex, Inc., 15 Wiggins Ave., Bedford, Mass. 01730.

HP Introduces Hand-Held Unit

PALO ALTO, Calif. — A hand-held computer said to perform compound interest, internal rate of return, loan amortization and depreciation calculations is available from Hewlett-Packard Co.

The HP-41 features plug-in application modules and interchangeable keyboard overlays and performs 130 operations, including 68 built-in mathematical and data manipulation operations, the vendor claimed.

Available in two programmable models, the HP-41 is priced at \$250 from Hewlett-Packard Co., 1501 Page Mill Road, Palo Alto, Calif. 94304.

PDP-11 Line Gets Low End

(Continued from Page 89)

tem, while the 522 and 528 utilize the CTS-500 software. Typical Datasystem configurations include the 346, with 128K bytes of memory, dual RL02 storage disks and a VT100 CRT terminal; the 348, with 256K bytes of memory, dual RK07 disks and the CRT terminal; the 522, with 256K bytes of memory, a Decwriter III terminal and dual RL02 disks; and the 528A, with 256K bytes of memory, dual RK07 disks and a Decwriter III.

The Datasystem 528E has the hardware of the 528A, but has DEC's extended-addressing option and 512K bytes of memory, plus the Cobol programming language, the spokesman noted.

Prices for the Datasystems with software begin at \$35,800.

Additional information on the 11/24 and its system derivatives, which will be delivered in bulk this summer, can be obtained from DEC's headquarters at 146 Main St., Maynard, Mass. 01754.

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Spectra Disk/Tape Controllers Run on DG, DEC-Type CPUs

SANTA CLARA, Calif. — Spectra Logic Corp. is offering several disk and tape controller devices for Data General Corp.-compatible and Digital Equipment Corp.-compatible computers.

The single-board Spectra 10 emulating disk controller reportedly allows attachment of storage module device (SMD) disk drives to DG-compatible computers.

It will be available in August and costs \$4,000.

Four Versions

The Spectra 11 emulating disk controller comes in four firmware versions and is compatible with the DEC PDP-11 series of computers. A single-board device, it will be available in July and costs \$4,700.

The Spectra 14 emulating disk controller reportedly provides emulation of the MSM-80 and MSM-800 Perkin-Elmer Corp. disk subsystems while attaching up to four 80M-byte or 300M-byte compatible drives. It is currently available and costs \$6,000.

The Spectra 20 is a multi-function disk and tape con-

Image 800 Runs At 150 Char./Sec

OREM, Utah — Novell Data Systems, Inc. has announced the Image 800 series printer for small business systems requiring 150 char./sec print speed and a 136-col output.

The microprocessor-controlled unit costs \$1,695.

The vendor is at 1170 N. Industrial Park Drive, Orem, Utah 84057.

troller for DG Nova and Eclipse minicomputers. It is reportedly able to attach both removable pack or fixed Winchester SMD disk drives and "start/stop" or "streaming" .5-in. formatted tape drives. It costs \$5,100.

The Spectra 21 single-board, multifunction disk and tape controller is designed for PDP-11s, offers software

transparency to standard DEC operating systems and diagnostic software. It attaches up to four SMD disk drives and eight formatted tape drives without modifying the operating system hardware, the vendor claimed.

It costs \$6,000, the vendor said from 1227 Innsbruck Drive, Sunnyvale, Calif. 94086.

Sales Prospects Tracked

WELLESLEY, Mass. — Information Recall Systems, Inc. has unveiled a turnkey system that reportedly tracks sales prospects, generates sales correspondence and call lists, ensures follow-up and produces management reports.

The Irsi Prospector is designed for sales personnel and searches combinations of up to 25 categories such as last activity date, status, territory, salesperson, product and lead source, the vendor claimed.

The system includes a Digital Equipment Corp. PDP-11 CPU, video display, dual floppy disks and letter-quality printer.

It costs \$21,900, the vendor said from 17 Avery Square, Needham, Mass. 02194.

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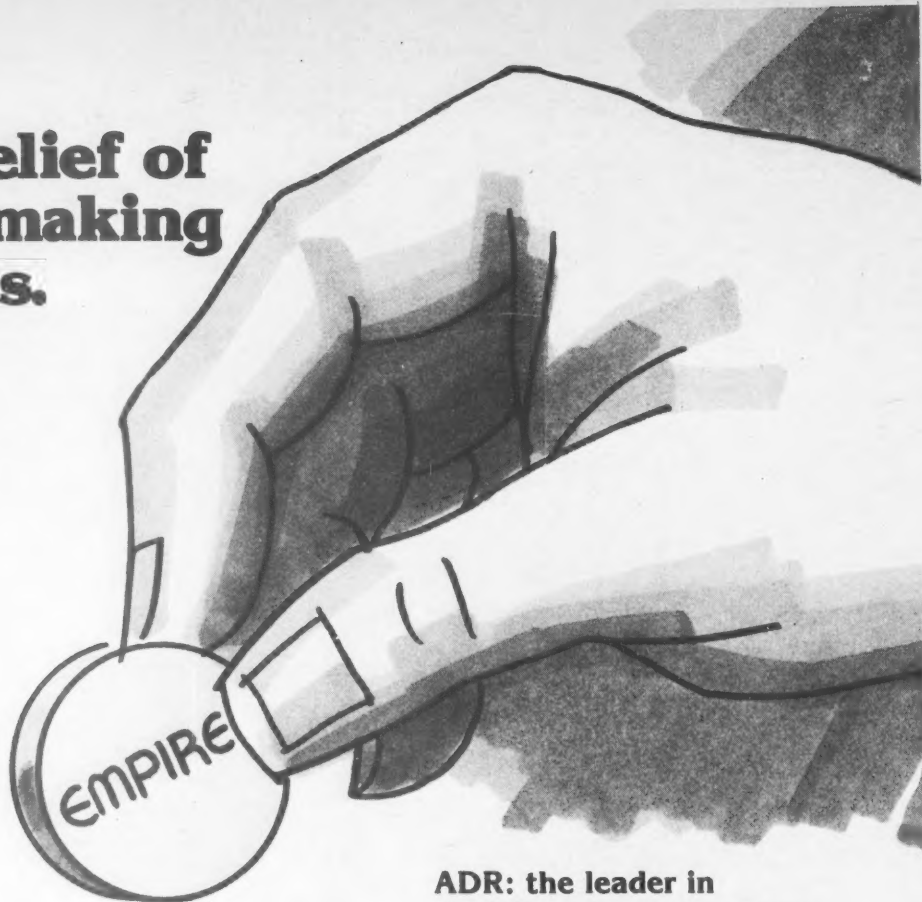
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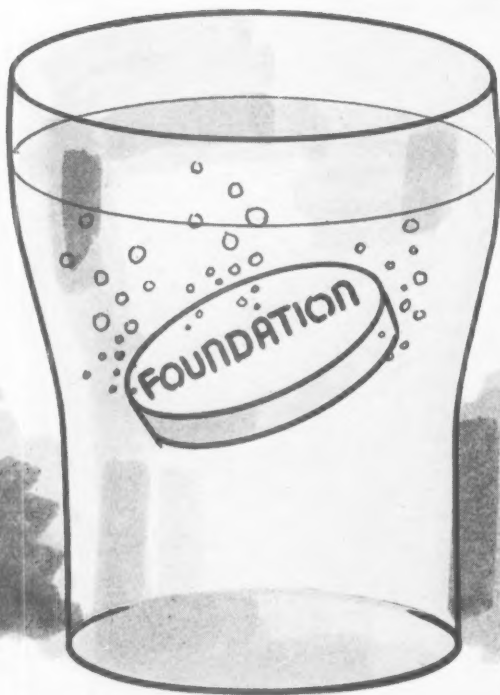


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His Software Dream Comes True

By Marcia Blumenthal
CW Staff

RESTON, Va. — Some people dream about adventures in far-off lands. But John Norris Maguire, for the past 10 years, has dreamed of selling multiple copies of standard software packages.

Today his dream is a reality. Maguire, president of Software AG of North America, Inc., first realized the possibilities of profits that could be made from volume sales of software while working for CACI, Inc. in the early 1970s.

Searching for distributors for CACI's software products in Europe, Maguire discovered Adabas, an IBM-compatible data base management system (DBMS) developed in West Germany.

Back in 1971, however, CACI was more interested in Fos-



John Norris Maguire

CW Photo by M. Blumenthal

tering its consulting services than importing software products. So Maguire purchased the rights to Adabas and began

marketing the product in the U.S. from the "back of my Mustang."

Known in the industry as "the

salesman's salesman," Maguire, by 1973, managed to get Adabas on Datapro Research Corp.'s software honor roll.

His knack for marketing was discovered during a stint doing programming for Lockheed's Computer Division. Maguire had submitted to top management a plan for reorganizing the division.

"I was programming and the manager came down and took the pencil out of my hand and said 'You belong in marketing,'" Maguire recalled.

And that's what Maguire has done ever since.

Although he thrives on the marketing aspect of the business, Maguire is the first to stress research and development. Some 20% of the company's revenues are allocated to R&D and product en-

(Continued on Page 96)

Tight Money Seen Hurting CRT Mart

MEDFIELD, Mass. — High interest rates and a tight monetary policy are having a significant impact on demand for CRT terminals, according to Advanced Resources Development (ARD), a consulting firm here.

With 1980 shipments of alphanumeric CRT displays up only 18% over 1979 levels in an industry which has traditionally realized annual growth rates of 30%-35%, ARD expects the depressed level of activity to continue for some time.

Chris Whichard, the company's president and founder, claimed that while demand picked up in the second half of 1980, the trend has not continued and the first quarter this year saw a leveling off in purchases.

"If the Federal Reserve Board's tight money policy continues under the Reagan Administration, it will impact terminal shipments to quite a big degree," he said.

In its latest study, "CRT Terminal Markets 1980-1985" ARD says that terminal manufacturers started the year with high backlogs and expectations of growth rates exceeding 30%. But following the Fed's tight money regime,

implemented in the first quarter of 1980, orders dipped and they began 1981 with backlogs considerably lower than in previous years.

Shrinking Orders

The study estimates that shipments in 1981 will only grow at between 11% and 18% as shipments rise from the 1980 level of

673,000 units to between 750,000 and 800,000 units, valued at \$2.8 billion at end-user prices.

"With the recession, users have been reluctant to buy new computers, and since terminals are used heavily in systems, new equipment ordered with mainframes has shrunk quite a bit," Whichard said.

Because of the slowdown in demand, the large OEM distributors, which traditionally go after big-volume orders and then sell to the end user, have also been impacted with high interest rates, making it expensive to keep the normal level of inventories.

Whichard claimed that with new equipment sales down, users

(Continued on Page 101)

Through 1984

Superminis Seen Edging Out Minis

By Jeffry Beeler

CW West Coast Bureau

SAN FRANCISCO — The traditional minicomputer market is steadily shrinking as superminis slowly nibble away at its boundaries from the bottom and superminis do likewise from the top, several industry representatives noted at a recent conference here.

Through 1984 and perhaps beyond, superminis and superminis will continue to gain market share at the expense of the traditional minicomputer sector, according to Dr. Efreem Mallach,

manager of market and competitive analysis at Honeywell Information Systems, Inc.

Although the capabilities of today's minicomputers are still steadily increasing, the computing power of latter-day microcomputers is improving much more rapidly. If this discrepancy in performance growth rates continues, the technological edge that minis now hold over superminis will eventually evaporate, Mallach predicted during the recent OEM Business Forum sponsored by Computer Business News.

In other words, 8-, 16- and 32-bit superminis will someday equal the performance of minicomputers in the corresponding technology class, the result being that the less expensive micros will increasingly dominate the low end of the small-systems market, Mallach said.

Converging Markets

A similar view of the minicomputer field's near-term future was expressed by another OEM forum speaker, Robert Wickham, president of Vantage Re-

(Continued on Page 101)

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Janeway Predicts 'Boomflation' for U.S.

By Rita Shoor

CW Staff

ATLANTA — Stagflation is about to be replaced by "boomflation," according to economist Eliot Janeway.

The keynote speaker advised attendees at the recent Management Science America, Inc. (MSA) users conference to forget about stagflation because it is ready to be relegated to the category of "things you know that just ain't so."

Boomflation is a new phenomenon that will be characterized by a "jet-like" takeoff for the U.S. economy. Wage levels will begin to climb during the second quarter of 1981, he said. Lest the audience become overly optimistic about the prospect of accelerated salary increases, however, he maintained that costs will continue to



Economist Eliot Janeway keynotes Atlanta MSA users conference.

CW Photo by R. Shoor

outrun sales and income levels.

The "computer folk" must share re-

sponsibility for causing boomflation,

Janeway said. He felt that the "protec-

tive cover of computerization" has resulted in a tendency to lose sight of what it is that the computers are counting.

Different Dollars

We tend to say "that a dollar spent at the hairdresser or at a ski run made as vigorous a contribution to the viability and growth of the economy as a dollar spent in a machine shop," he explained. "We're about to learn the hard way that while we get distracted by meaningless numbers... we've lost our ability to meet our requirements."

His recommendation for success to graduates who will emerge into the boomflation economy is to "avoid getting ensnared in MBA courses. Instead, get a head start and go to work," Janeway advised.

One reason for his position is the lack of worthwhile technological courses at the university level. Janeway maintained that while he knew of places in the U.S. where one could get a degree in cooking, counseling — even jogging — he did not know of a single course in any undergraduate institution in this country that taught robotization. On-the-job training is the likely alternative for technically oriented students, he said.

Gaining technical expertise will be worth the effort because this country is "on the verge of a very dramatic, advanced, automated technological catch-up that is going to be very expensive. Rather than shutting the economy down, we are in the process of spurring it on," he claimed.

Thus, Janeway predicted the emergence of "a new crop of scientists who don't want to be bought out by IBM" and who are not organization men and women.

There will not be an excess profits tax to punish the high-technology firms that are currently being pursued by large conglomerates, according to Janeway. Instead, a generation of "Henry Ford-type leaders" will emerge to help these firms vault into premium growth positions.

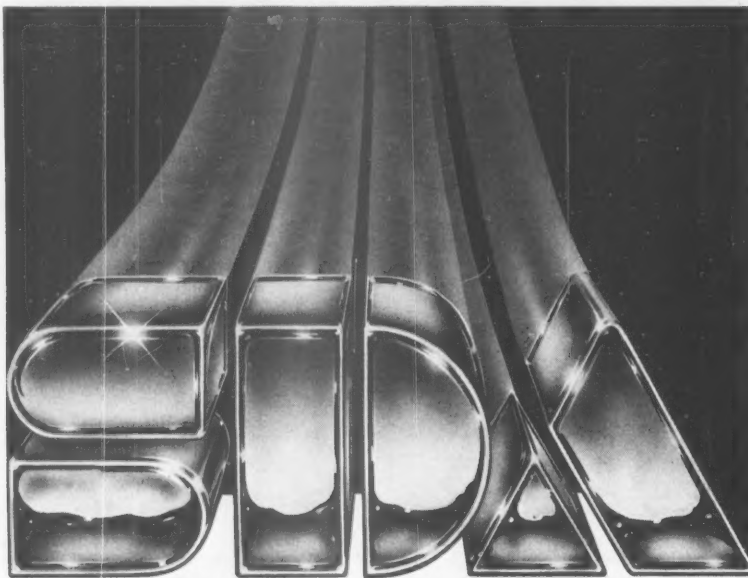
He anticipated "a tremendous bulge in borrowing of all kinds," accompanied by very high interest rates. However, the fact that business will speed up does not necessarily bode well for the stock market, he said. In fact, he felt that the stock market would be a major victim of hyperinflation.

GTE Unit Renamed As GTE Telenet, Inc.

STAMFORD, Conn. — GTE Communications Network Systems, Inc. has changed its name to GTE Telenet, Inc. The company is one of four major operating units of General Telephone & Electronics Corp. (GTE), and is responsible for voice, data and information systems and services marketed to business and government customers.

The company has incorporated in its name that of its subsidiary, GTE Telenet Communications Corp. In addition to changing the name of GTE Communications Network Systems, its two other subsidiaries will include GTE Telenet in their names.

The four units of the company are GTE Telenet Communications Corp., GTE Telenet Information Services, Inc., GTE Telenet Systems Inc. and GTE Telenet Field Engineering.



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'Ayatollah' Policy Brings MSA to Revenue Goal

By Rita Shoor
CW Staff

ATLANTA — Although it took "an Ayatollah policy," Management Science America, Inc. (MSA) achieved its goal of \$46 million in revenue during 1980, John Imlay, chairman of the board, informed MSA users at its annual conference here.

The software firm was forced to drastically cut its expenses last year. This was at least partially attributable to a three-month period characterized by "plenty of expenses, lots of new construction and no income," Imlay explained. Between June and September of 1980, when the interest rates hit 20%, MSA "sold nothing," he told members of Future, the company's newly named user's group.

High interest rates were not the only factors with which the financial software firm had to contend. There were "apparently a lot of problems with Release 21" of its general ledger package — a statement which met with nods and murmurs of agreement from audience members. These problems have now been resolved, according to the executive.

MSA also faced competition from several other firms specializing in accounting and financial software, he noted, according specific mention to McCormack & Dodge Corp. and University Computer Co.

But thanks in part to top-management's Ayatollah-like attitude

toward expenses, MSA went from revenues of \$35 million to \$46 million, he said.

The company, expected to go public in the near future [CW, March 2], will be facing some stiff competition from IBM in the next few years, Imlay predicted. Describing IBM as "looming over" MSA, he anticipated a full-fledged effort from that company in the software-package area by 1985.

In contrast to IBM, the investing public probably perceives MSA as a relatively tiny company, Imlay admitted.

However, industry sources have predicted that software and service revenues would surpass those of the hardware industry by the mid-1980s, he added.



CW Photo by R. Shoor

MSA Board Chairman John Imlay

Newsletter Keeps Tabs on Publicity

SAN FRANCISCO — A newsletter designed to keep entrepreneurs, marketing directors and advertising professionals abreast of the latest developments in computer, electronics and industry publications has been launched by Hi-Tech Publicity Consultants.

"Computer Publicity News" will offer "how-to" articles on all aspects of public relations and advertising, as well as tips from editors about how to work effectively with their publications, Hi-Tech said.

The monthly newsletter, which will cost subscribers \$195 a year, is available until June 1 at a \$165 charter subscription rate. It is based at Suite 170, 44 Monterey Blvd., San Francisco, Calif. 94131.

Letter Examines Growth Stocks

CONCORD, Mass. — "High-Technology Growth Stocks," an investment newsletter concentrating on fast-growing high-technology companies, is now available.

Each issue will provide investment analysis and other features including a discussion of one of the major high-technology markets, company profiles of firms which represent attractive investments, a calendar of high-technology stocks and statistical information of all recently selected stocks, the publisher said.

A one-year, 12-issue subscription costs \$95, from "High-Technology Growth Stocks," 402 Border Road, Concord, Mass. 01742.



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'Adabas' Proves Answer to Exec's Dreams

(Continued from Page 93)

hancements. Software AG's R&D is focused on devising tools to make the firm's products easier for customers to use rather than improving performance, Maguire noted. "And machine time be damned."

That attitude made it difficult early on for Maguire to convince users of the merits of Adabas when machine time and core memory were expensive.

"We put our money in the future to make it easier to develop data base applications. I knew the cost of machine time would come down," Maguire said.

Arch Rivals

Today, competitors with "designer" rather than user-oriented packages are "starting to sweat," Maguire claimed, making subtle reference to arch-rival Cullinane Database Systems, Inc.

The competition between Maguire and John C. Cullinane, president of Cullinane, is well known in the industry. The two executives often send each other notes with humorous barbs.

Ease of use has been the major selling point for Adabas and Software AG's other major product lines: Com-Plete, a teleprocessing and interactive programming development system; Adabas-M, a DBMS for use on Digital Equipment Corp. systems; and Natural, an interactive programming language.

Each product line has its own R&D staff. Unlike competitor Cincom Systems, Inc., Software AG concentrates primarily on IBM products. "Working on the systems of too many vendors will devastate R&D," Maguire maintained.

"Five years ago only technical people came to visit the company when in the market for a DBMS. Today users are representatives of the purchasing group," Maguire noted.

Data Base Processor

Because of machine time requirements for its DBMS applications, Software AG was the first software company to introduce a data base processor [CW, Oct. 27].

Although other DBMS com-

petitors have scoffed at the concept of data base processors [CW, Jan. 26], Maguire said a typical Software AG user takes up 85% of the capacity on an IBM 3033 with data base applications. Software AG's \$307,000 data base machine is built around an IBM-compatible processor from Cambex, Inc.

Besides offloading data base applications to a less costly CPU, Maguire views the data

base processor as the company's initial step into distributed data processing (DDP). Software AG's approach to DDP is providing functionally distributed processors rather than local general processing capability on multiple processors.

While the data base processor was a new tack for Software AG, Maguire says the firm's larger strategy hinges on remote diagnostic maintenance capability. For its software, the company already offers Instant-On-Site-Support, a remote diagnostic capability.

Right now Cambex is putting the finishing touches on a diagnostic monitor for remote support of the data base processor.

That remote capability was the major reason holding up the introduction of the data base machine, Maguire maintained.

In the process of realizing his dream of volume sales of software products, Maguire has seen the company grow at an average rate of more than 50% annually for the past five years. Last year sales were \$11.6 million, with net earnings of 10%.

Although rumors abound that Software AG will go public this summer, Maguire was uncharacteristically mum on the subject.



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Nickels & Dimes

Comserv Corp. has announced it intends to file a registration statement for a public offering of 300,000 shares of its common stock. The proceeds of the offering, which is expected to be made in April, will be used to increase working capital.

\$\$\$

Avanti Communications Corp. has completed a \$1 million private placement with

Business Development Services, Inc. (a subsidiary of General Electric Co.) and Trans Venture AG (a subsidiary of Trans KB). Avanti also completed the repurchase of shares of common stock owned by M/A-COM, a Burlington, Mass. company, and terminated all merger discussions with M/A-COM.

\$\$\$

The American Stock Ex-

change traded 1,599,839 common shares of T-Bar Inc. Trading under ticker symbol TBR, the new issue opened on 100 shares at 20 3/8.

\$\$\$

Safeguard Business Systems, Inc. has announced a 20% increase in its regular quarterly cash dividend. The dividend of 8 cents/share will be paid on April 1 to shareholders of record on March 19.

OPM Suit Documents: Banks Could Lose Big

NEW YORK — Banks and other financial institutions may stand to lose more than \$100 million from loans they made to OPM Leasing Services, Inc. which were secured by allegedly phony lease contracts, according to documents filed in federal bankruptcy court here recently.

Contained in the document are statements by Rockwell

International Corp., one of OPM's prime customers, that there is more than a \$100 million difference in what Rockwell International owes on those leases and what financial institutions say the company owes.

OPM Filing

Shortly after news of the lawsuits and federal investigation of the matter became public earlier this month, OPM filed for protection from its creditors under Chapter 11 of the Federal Bankruptcy Act.

In its filing, the leasing firm listed assets of \$446.1 million and total liabilities of \$504.6 million, of which some \$475 million were for "discounted lease rentals and equipment purchase obligations," the leasing company said.

The three plaintiffs against OPM — Rhode Island Hospital Trust National Bank, Lincoln National Life Insurance Co. and Westdeutsche Landesbank Girozentrale — have charged OPM received \$10 million in loans by presenting forged lease documents signed by Rockwell International executives.

While financial institutions stand to lose enormous amounts of money, users who have equipment on lease through OPM may lose at least \$100 million, with some loss estimates set at a quarter of a billion dollars.

These losses are a result of the plunge in the value of computers leased to users by OPM, largely IBM 370-type equipment, which plummeted in value after IBM introduced its 4300 series of systems in 1979.

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Factory workers assemble and solder printed circuit boards.



Worker concentrates on printed circuit board.



Gao Chou-Zao is deputy chief engineer of Peking No. 1 Computer Factory.

Peking No. 1 Computer Designs Both Computers

By Michael A. Rae

Special to CW

PEKING — The Peking No. 1 Computer Factory, formerly known as the Peking Telephone Equipment Factory, was built in 1957 with Soviet technical assistance. Its original line of business involved the building of step-type switches and stepping relay systems; much of the production at the plant still appears to be crossbar-type exchanges for trunklines and large enterprises.

The engineering staff, according to Deputy Chief Engineer Gao Chou-Zao, designs both computers and telephone equipment. There are about 20 computer plants in China, Gao said. Each designs its own

computers, but shares ideas and experience with the other plants.

The Peking No. 1 plant, Gao said proudly, is the nation's oldest and most prestigious computer plant.

Situated on the outskirts of the Chinese capital, it covers a total area of 100,000 square meters, of which 70,000 are actual work area. Rows of Chinese cabbage lie drying in the sunny courtyard during the winter months.

Some 5,000 assembly workers, engineers and administrative personnel are employed at the plant. Average pay is about 60 yuan — roughly \$40 per month.

According to Gao, the plant manufactures all its own printed circuit boards, primarily with Chinese-made equipment. The factory is currently building two-layer boards. Integrated circuits entirely replaced tubes in 1977.

Mini Development

In 1975, the plant's engineers began research which resulted in development of the DJS154-2 minicomputer. Production began in 1977, and annual output is now about 72 units.

According to the computer's

technical literature, it was designed for scientific, data processing and industrial process control applications. Basic, Fortran and Algol can be run on the 154.

The DJS154-2 operates with paper tape. Core memory is 4K words (53-bit word including 3-bit parity), expandable up to 32K words. In addition, the Model 220 floating-head magnetic drum can be configured in for additional memory. Prices vary from 150,000 to 200,000 yuan, about \$100,000 to \$134,000.

In 1979, the factory's engineers designed the DJS220-1, described as a medium-sized, general-purpose computer for scientific, engineering, data processing, data communications and real-time control applications. Production began toward the end of 1980; about six units have been assembled to date.

The components are, for the most part, ordered from other plants and assembled at No. 1, Gao revealed. Main memory is said to be 64K words, expandable to 128K words.

As with the factory's other model, the 220-1 offers floating-head magnetic drum additional memory. One-half-inch and one-inch magnetic



This is the printer for the DJS154-2 minicomputer, the factory's latest.

Plant, the Oldest in China, and Telephone Equipment

tape is available, along with paper tape punch and photoelectric tape reader.

According to the 220-1's designers, magnetic disk, graphics display with light pen and data communications control peripherals will soon be added.

The plant's first computers were essentially derivations of various early Soviet computers. For example, the August-1 was based on the USSR's first-generation Ural-2. The plant's first digital computer was built in 1962. Only by the mid-1960s were transistors introduced on a wide scale in Chinese computers.

The first fully transistorized Chinese computer was most likely the DJS-21, with ferrite core memory of 4K, first seen by foreigners in 1966. That same year, the transition to second-generation computers began. In cooperation with the prestigious Peking Institute of Computer Technology, the DJS-21 Model III — China's first computer based on integrated circuits — was built in 1968.

The Model III pioneered in other ways. It featured a CRT capable of displaying both Chinese and Roman charac-

ters. The 32K-byte memory, TTL-logic Model III became a production model in 1970.

state procurement bureau, with little contact with the ultimate consignee. Now, for the

Rae visited the No. 1 Peking Computer Factory during a recent trip to the People's Republic of China to attend a trade exhibition sponsored by the U.S. Department of Commerce. Here, in words and pictures, is what he saw during that visit.

How are computers sold and serviced within China? According to Gao, each plant operates as an autonomous commercial entity. No field sales and support offices have been established.

Since self-reliance is a national industrial goal, the customer generally buys plenty of spare parts with his computer at the outset. If any problems arise that are too serious to be corrected by the customer's staff, he must go to the factory for support.

In 1978, China's computer industry abandoned its state-controlled sales policy and adopted instead a "marketing policy." The first tangible result of the new policy is the precipitous drop in the price of Chinese-made computers.

The No. 1 formerly was required to sell its output to a

first time, the factory engages in direct contact with its own customers, thereby establishing a feedback mechanism.

Rae is vice-president of Welt International Corp., a Washington, D.C.-based trading company specializing in equipment and materials for the electronics industry.



A worker tests components.

Photos by M. Rae



Component testing continues.



A floating-head magnetic drum memory on a DJS154-2 mini looks like this.



The dish at the left is for rejects.

Supershorts

Standard Logic, Inc. has signed a five-year agreement appointing the customer service division of TRW, Inc. as exclusive maintenance service representative for Standard Logic's Dart family of point-of-sale systems.

Ten companies have made gifts and pledges of \$7.5 million toward Stanford University's new Center for Integrated Systems. The first 10 sponsors are General Electric Co., Fairchild Camera & Instrument Corp., Hewlett-Packard Co., Honeywell, Inc., IBM, Northrop Data Systems, Inc., Tektronix, Texas Instruments, Inc., TRW, Inc. and Xerox Corp.

Microdata Corp.'s Results applications software is now available from the company's authorized dealers nationally. Results was formerly available only through Microdata's direct sales offices.

Intertel has reorganized its sales staff and added new sales offices nationwide.

The Digital Telephone Systems Division of Harris Corp. has established an organizational unit to sell PBX systems to the interconnect market.

Magnuson Computer Systems, Inc. has entered a three-year agreement with Carl Amdahl for his services as a consultant in computer architecture and product marketing. Amdahl will join Acsys Ltd. as vice-chairman of the board and continue as a member of the Magnuson board.

Telecom Systems Group, Inc. has announced a joint venture agreement with Aregon International under which the two organizations will market each other's services and collabora-

rate on international joint projects. The two companies plan to join forces on a number of projects in the network and videotex fields and to mount a series of joint seminars in Europe covering subjects such as international network design and videotex.

Honeywell, Inc. presented MIT with the first installment of a \$500,000 contribution to support research in advanced computer sciences.

Hitachi, Ltd. has entered into an agreement with Standard Microsystems Corp. providing for the worldwide nonexclusive cross-licensing of each corporation's patents and patent applications relating to the field of semiconductor technology.

Sykes Datatronics, Inc. has manufactured and shipped its 10,000th Comm-Stor unit. The unit, a Comm-Stor II, was shipped to Western Union for use

in its line of automated funds transfer terminals.

Computer Sciences Corp. has extended its Infonet remote computing service to Japan. Mitsui Knowledge Industry Co., a subsidiary of the Mitsui group of companies, will provide marketing and technical support functions for the Computer Sciences service in Japan.

Digital Research, Inc. has announced the "Independent Software Vendor (ISV) Support Plan" to encourage software development. The plan includes ISV seminars, technical support, licensing and software protection information, newsletters and an ISV referral catalog for Digital Research customers interested in CP/M-compatible products. The three-day ISV seminar covers PL/I-80 applications and system programming, and legal and marketing aspects of developing a software business.

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Executive Corner

- Robert O. Gunderson has been appointed assistant vice-president of corporate engineering and advanced development at NCR Corp.
- Edward N. Friedman has been named assistant vice-president, director of system development and maintenance, at System Analysis Corp.
- Dr. Stephen Forte has been named manager of American Microsystems, Inc.'s central marketing worldwide.
- Harold J. Rieser has been appointed director of dealer sales for Prime Computer, Inc.
- G.T. Orwick has been promoted to treasurer of Management Science America, Inc.
- William S. Sadler has been elected president of Dotronix, Inc.
- John P. Walker has been elected

president and chief executive officer of Ontel Corp.

• George P. Huard has been promoted to vice-president of engineering for the Ball electronic display division, a subsidiary of Ball Corp.

• Robert J. Pearce has been appointed vice-president of systems at Waybern Corp.

• Richard K. Hodge has been promoted to vice-president of the Business Information Products Division of On-Line Systems, Inc. Mary Anne Best has been named director of marketing and Steven J. Fredrickson has been named director of sales.

• John J. McDonnell has been appointed vice-president of international operations at Tymnet, Inc. and Ronald P. Bernier has been named vice-president of field operations.

• Wayne P. Glaser has been appointed vice-president, international, at General DataComm Industries, Inc. James O'Meara, also at General DataComm, has been named vice-president of sales.

• George D. Porter has been appointed vice-president of sales for the computer supplies division of Pryor Corp.

• H.J. Kilsdonk has joined Quantum Corp. as product marketing manager. Joseph F. Bartholomew has been named Eastern regional sales manager and Bruce Edwards has been named Southwestern district manager.

• Dr. Dallas Hack has been named vice-president of engineering at Microtech Business Systems, Inc.

• Kathryn A. Dzubeck has been appointed vice-president of operations at Communications Network Architects, Inc.

• Merrill E. Spiller has been named vice-president of manufacturing for Aviv Corp.

• E. Joseph Zemke has been appointed executive vice-president of field operations for Auto-trol Technology Corp.

• James E. Dietz has been appointed vice-president of engineering at Wilson Laboratories, Inc.



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Drop in Demand for CRTs Traced to Economic Woes

(Continued from Page 93)

are going in for upgraded add-on capabilities, which has helped to soften the blow for the CRT vendors so far.

Nevertheless, he added, with companies implementing their forward plans at a slower rate, smaller vendors, which rely on large orders for a healthy cash flow, could well experience some difficulties.

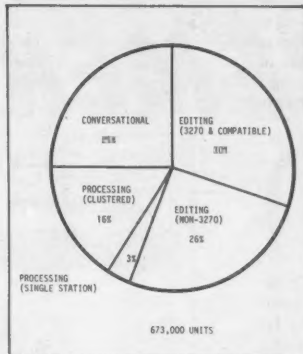
Bright Spots

There are some bright spots, however. According to the study, shipments of CRT terminals at the low end of the market, such as those for minicomputers and small business systems, increased by 20% in 1980 over the previous year, with sales of conversational terminals boosted by increased production and delivery of the DEC VT-100.

"Dumb" CRT terminals are projected to show slower growth in the next five years as added features move them to the "smart" or editing category.

Shipments of the IBM 3270 and 3270 plug-compatible terminals led all terminal categories in unit volume with nearly 30% of the 1980 shipments being this type. The Courier division of ITT, Memorex Corp., Teletype Corp. and the Tribex division of the Mohawk Data Sciences Co. were among the plug-compatible vendors to do well in this market.

However, editing CRT terminals, not compatible with the 3270 protocol, are



1980 Shipments of CRT Terminals

growing at a faster rate than their 3270-type counterparts. They achieved a 26% slice of the market in 1980 and are expected to dominate shipment volumes by 1983. This is because the non-IBM user base is bigger than the IBM one, when including the mini makers and small business systems market as well as major manufacturers such as Honeywell, Inc., Sperry Univac and Burroughs Corp. Hence there are more places and opportunities to use these editing terminals than is available with the 3270 line.

All in all, the study projects that 4.6 million CRT terminals will be shipped over the next four years. Copies of the report are available from Advanced Resources Development, 28A Park St. Station, Medfield, Mass. 02052.

Superminis Seen Threat To Traditional Mini Market

(Continued from Page 93)

search, Inc. In a keynote address opening the second day of the two-day conference, Wickham told attendees that the microcomputer and minicomputer markets are steadily converging.

"The micro business is still very much technology driven," and for many OEMs, "micros may be a better horse to ride than the minis that currently exist," Wickham said. Unlike minicomputers, microcomputers enjoy the advantage of having standard software and instruction sets, and in the future, many programs whose use is currently restricted to minis will eventually be modified to run on micros as well.

Both Wickham and Mallach stopped short of predicting the ultimate extinction of the traditional 16-bit minicomputer business. Mallach, in fact, assured OEMs, "It may still be a very intelligent decision for equipment resellers to enter the 16-bit mini market."

But by the same token, he said, OEMs doing business in the traditional minicomputer arena would be well advised to keep themselves continually abreast of developments in the supermini and supermicro fields.

Dividing Line

Looking four or five years ahead into the small-systems future, Mallach outlined a market scenario in which the line separating the supermicro and supermini sectors will be drawn at

roughly the \$60,000 mark. Below that point, computer sales will eventually be dominated by the supermicros; above that dividing line, the field will belong to the superminis.

As matters stand now, the most advanced species of microcomputers — the 32-bit machines — have only barely begun to make their market presence known. But by 1985 or 1986, several competing versions of 32-bit supermicros will be reaching end users in volume from various industry sources, he predicted.

During the next four or five years, the upper technological limit for supermicros will rise "very rapidly," Mallach said, and will be defined by the maximum amount of processing work that can be done with a few dedicated chips. The lower limit, meanwhile, will come at the point at which a supermicro's performance and features cease to justify the product's cost.

At the opposite end of the small-systems spectrum, the supermini sector will reach its upper technological limit "at the point beyond which a simple, subtable architecture can no longer be stretched," Mallach said.

The largest systems in the supermini price class are expected to improve their capabilities by 20% to 25% per year during the next few years and by 1990 will likely rival the performance of IBM's recently introduced 3081, Mallach predicted.

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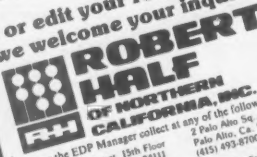
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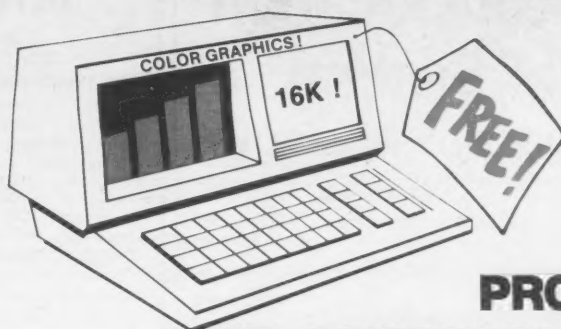
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As we enlarge the capability of microprocessors through innovations in semiconductor technology, we create new challenges for software professionals. The science (or art if you prefer) of software design plays a major role in our business. If you are interested in new advances in software development, we can offer you leading edge involvement in two attractive locations:

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For prompt consideration, please send your resume to: L.A. Bannowsky, Intel Systems Corporation, Dept. 13AC, P.O. Box 9968, Austin, TX 78766. An Equal Opportunity Employer M/F/H.



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Applications are invited for position of Data Systems Manager. Responsibilities: analyze existing procedures and requirements for on/offline computer applications of business functions. Assist user departments and data processing personnel define current and future needs. Design and coordinate development of applications systems, including programming and complete documentation.

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DATA RESOURCE CORPORATION, headquartered in Atlanta, is a leader in quality Contract Programming and Consulting. Our continued growth in the Southeast and Southwest has created opportunities for versatile Professionals with state-of-the-art skills in Programming and Systems Design.

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Mississippi State University
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Mississippi State, MS 39762

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Optimally, you should have some or all of the following qualities:

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At Quadrex, you'll enjoy the satisfaction of being a visible and valuable member of a winning team that has more than tripled in size in just the last two years. We offer an excellent compensation and benefits package, including COMPANY-PAID RELOCATION, comprehensive medical and dental program, annual cash distribution program and stock purchase plan. Quadrex is an equal opportunity employer.



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Starting Salary:
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Requirements: BS in Business/Data Processing/Accounting. Experience: 5 years programming, 3 years systems analyst, project leader a plus, commercial, transportation systems. Proficiency on-line medium scale IBM computers using COBOL/RPG 2, CICS - DATA BASE (a plus). Duties: Analyzes, designs, develops, implements application systems. Manages project personnel to achieve schedule. Contact: Cheryl (218) 368-2225.

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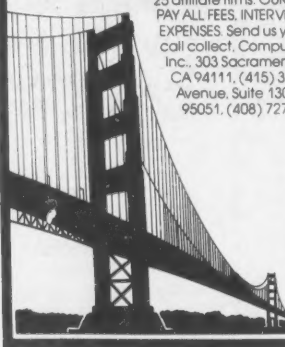
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Mr. Robert S. Shest, Chairperson
Department of Math and Computer Science
Millersville State College
Millersville, PA 17551

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These positions require:

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PROGRAMMER/ANALYST
University of Wisconsin-Parkside

We seek an aggressive programmer/analyst to serve as project leader and share in the responsibility for the design and implementation of our on-line university systems. The successful candidate should have system design and programming experience. Proficiency in either PL/I or COBOL is required. A Bachelor's degree with experience in teleprocessing is desirable.

UW-Parkside is a medium-sized university in a pleasant suburban environment located in southeastern Wisconsin. Equipment includes a DEC 11/70 and IBM 370/135 under DOS/VS using WESTI teleprocessing software. AN IBM 4331-2 is scheduled in January.

Starting salary depending upon experience and education. Outstanding fringe benefits and educational opportunities available. Send resume to:

William M. Miesmore
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University of Wisconsin-Parkside
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Assistant Deputy Commissioner for Information Systems

Texas Department of Human Resources has a vacancy for the position of Assistant Deputy Commissioner for Information Systems in Austin, Texas. Job requires 4 year degree in computer science, mathematics or business administration with DP specialization plus 5 years experience in DP, two years must have been in a management capacity OR 9 years experience in DP with 4 years in a management capacity. Salary up to \$37.8K depending on experience. In order to be considered please contact Mr. Steve Rye, Office of the Deputy Commissioner for Information Systems, Texas Department of Human Resources, 512/441-3355, X 3023 or Mr. Sandy Nemeck, Personnel Div., Texas Department of Human Resources, 512/441-3355, X 4084 by April 15, 1981 for application procedures.

SENIOR SYSTEMS ANALYST

Established firm is seeking a highly motivated, experienced professional to direct the total DP effort — analysis, design, programming, and implementation — in response to diverse user requirements. Qualified candidates for this challenging position will have:

- 5-plus years experience as programmer/analyst
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Faculty position beginning 9-1-81. Applicant must have a strong interest in undergraduate teaching and be able to aid in the development of an Information Systems Management minor with applications to multiple disciplines. Minimum qualifications: Masters Degree emphasizing computer/information processing plus teaching and/or practical experience. Rank and salary (to 20K) dependent upon qualifications and experience. Excellent fringe benefits. Plymouth is a four-year comprehensive college situated in the heart of New Hampshire; 15 min from skiing and 2 1/2 hours from Boston. Submit resume, transcripts and names of 3 references to: Dr. William J. Yaffe, Box F, Plymouth State College, Plymouth, NH 03254. Deadline: 8/1/1981. ROE/AA employer.

MANAGER SYSTEMS DEVELOPMENT Banking

Prestigious San Francisco bank offers highly visible and challenging growth opportunity. This position requires someone with excellent managerial skills, as he or she will manage a department of 80 DP Professionals. Item processing applications experience and a previous track record of continuing advancement is necessary.

Other requirements include:

- State-of-the-Art IBM systems development experience
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- Action oriented personality with a desire to be measured.
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Excellent compensation commensurate with experience, and good potential for future growth.

We are consultants to management. For immediate consideration, please send your resume and salary history. In confidence, to:

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DATA MANAGEMENT DATA COMMUNICATIONS SOFTWARE RESEARCH & DEVELOPMENT

Due to our continuing rapid company growth and expansion of the MIS staff, we are seeking three individuals with at least 7 years in Data Processing and at least one year in management levels. The ideal candidates will have experience with large IBM environments in OS/MVS and DOS/VS along with proven background in on-line and data management technologies.

ANIXTER is committed to growth and to maintain this growth the computer will continue to play a significant role in all areas of its operations. We are currently installing a 4 meg 3033 model S and will be retaining a 3031 for application development and a 370/148 for software development. Our results oriented free-form style of management means that you will participate in the decision making process and set the direction in your area of responsibility.

MANAGER OF DATA MANAGEMENT will be responsible for coordinating all data/information in our DL/1 data base with all other sources of data, planning for our storage requirements in the short and long term, and conducting capacity measurements. Initially, the DBA will report to this person along with other support functions. This requires a creative person with a strong background in Data Base Management.

MANAGER OF DATA COMMUNICATIONS will be responsible for our current national data communications network of 250 remote terminals and planning for our short and long term communication needs such as earth stations, local networks, word processing links, electronic mail, response time measurements, line utilization. The candidate must have at least 2 years of state-of-the-art Data Communications experience.

MANAGER OF SOFTWARE RESEARCH & DEVELOPMENT will be responsible for planning our conversion to MVS from DOS/VSE, a conversion to TSO or an equivalent package from ICCF, and to upgrade systems to MVS/CICS and MVS/DL/1. It requires a creative and imaginative person to look into new areas that can improve overall system performance and conduct capacity measurements related to our three CPU's and on-line systems. A self starter with extensive exposure to IBM OS systems is necessary.

Qualified applicants should call or write:

Pete Colagiacomo, Assistant Director of MIS
(312) 679-5910

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We're a fast growing major force in the Data Communications industry with a wide product line including low, medium and high speed Modems, Time Division Multiplexers, Statistical Multiplexers and Network Diagnostic and Control Systems. Due to our continued growth, we have openings for Product Managers and Specialists, with the following responsibilities:

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- Define marketing strategy
- Develop product definitions and specifications
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- Determine sales directions

SPECIALISTS

- Manage product phase-in
- Perform competitive analysis
- Assemble price list cost info
- Prepare promotional material
- Follow-up on field problems

Successful applicants will have a technical degree; experience in sales and/or product management; an in-depth knowledge of data communications; and an ability to work independently as well as with engineering and manufacturing management. Specific experience with analog or baseband modems or with programmable concentrators/multiplexers highly desirable. These highly visible positions offer excellent salaries and growth opportunities. Qualified candidates should forward resume with salary history and requirements, indicating position desired, in strictest confidence to: Mr. George Stevenson.



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Rapidly growing on-line financial data center is searching for a self-motivated Systems Analyst/Programmer. Requires in-depth experience with the NCR CLASS package. Knowledge of VRX helpful. Excellent salary and benefits. Send resume in confidence to: Manager of Technical Services, Information Processing, Inc., 320 Whittington Parkway, Louisville, Kentucky, 40222.

Data Base Administration needed to manage a large growing IMS/VS Data Base environment and supporting staff. Responsibilities include design and review of data bases and system performance, access techniques and security, and installation standards and procedures. Preferred applicants will have extensive experience in various areas of Data Processing and an understanding of IMS/VS. Salary to \$27,500. Send resume to VP for Computer Affairs, Computer Services Division or apply at University of South Carolina, Employment Office, 743 Green St., Columbia, S.C. 29208, Monday thru Thursday, 9 to 11 a.m. or 1 to 3 p.m. An equal opportunity/affirmative action employer.

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The ideal candidates for this demanding assignment should have previous experience in system programming, assembly language programming and knowledge of operating system internals. Univac 1100 series experience is preferred.

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Right now we are seeking applicants for the following Deputy Director positions:

Salaries from \$35,600 to \$42,400

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Will provide state-of-the-art expertise in applications development to the MIS staff and users. Will plan, organize, control and formulate overall policy for application development. Will supervise all computer systems analysis and programming. This job requires extensive knowledge of on-line applications, computer systems design and analysis, programming languages, operating systems, structured programming methodology and project management.

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Will serve as chief Methods and Procedures Manager. Will provide state-of-the-art expertise in applications development in Word Processing, Microfilm and Microfiche, office layout, work flow and forms. This job requires extensive knowledge of "Office of the Future" technology, user documentation and training, implementation of Word Processing and Text Editing projects interfacing with other technical areas and management in Methods and Procedures.

Deputy Director/Technical Services

Will provide state-of-the-art expertise in data base management, software and hardware and communication equipment, networks and protocols. Will serve as chief Technical Manager. Job requires extensive knowledge of operating systems, data base, communications, software and hardware and technical management.

Deputy Director/Planning

Will establish and maintain long (3-year) and short (1 year) MIS plan. Will prepare projects for presentation to management and steering committees and will gather inputs for recommending priorities. Will establish, control and maintain Management by Objectives program for MIS people. Will institute Project Control and Monitoring system, forecast MIS requirements, and coordinate feasibility studies. The job requires knowledge of operations research and/or mathematics; knowledge of and experience in Data Processing and at least one programming language.

To qualify for the above positions you must have a minimum of 4 years experience in data processing and 2 years of administrative or executive experience, in addition to having demonstrated proven abilities in all aspects of the data processing field. If hired, you will also be required to live within the limits of New York City. Excellent fringe benefits include 4 weeks of annual paid vacation.

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Requires a BS degree in Computer Science, Data Information Systems or equivalent with a minimum of 4 years experience in systems programming. Must have knowledge of latest technologies of computer operating systems, programming, languages, data base and computer hardware. Responsibilities include reviewing specifications for new or changed computer applications, performing audits and recertifying the protection adequacy of operational computer applications, performing risk analyses for computer applications developing backup recovery procedures to prevent data loss and to minimize the interruption of computer services.

SYSTEMS ENGINEER

Requires a BS degree in Computer Science, Data Information Systems or equivalent with a minimum of 4 years experience in systems programming. Must have knowledge of latest technologies of computer operating systems, programming, languages, data base and computer hardware. Responsibilities include reviewing specifications for new or changed computer applications, performing audits and recertifying the protection adequacy of operational computer applications, performing risk analyses for computer applications developing backup recovery procedures to prevent data loss and to minimize the interruption of computer services.

SYSTEMS ANALYST

Position requires a BS degree in Computer Science, or equivalent with minimum of two years experience in the design and implementation of large Data Processing systems. Individual will serve as a team member to design and implement a new online accountability system. Responsibilities include interfacing with programmers and developing program specifications.

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We are seeking an individual experienced in systems design for computer applications in a manufacturing environment. BS degree in Computer Science, Engineering or related field is desirable. Requires experience in production-inventory control and MRP computer applications. This position provides a ground-floor experience in designing an MRP system with opportunities for advancement within the company.

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The administrative section of the Computer Center at Utah State University has a programmer/analyst position open to provide leadership in conversion from a Burroughs B-5600 to an IBM 4341. This position will include converting, developing and programming administrative systems using the IBM-4341. Qualifications: Knowledge of ANSI COBOL, IMS/DB, IMS/DC. Knowledge of ADF also desired. BS in computer science or related field with a business background. Minimum of 5 years experience in programming, primarily using COBOL, and extensive systems analysis experience with project responsibility. Demonstrated user interaction capabilities. Salary range: commensurate with qualifications and experience. We offer an excellent benefit package. Send resume, 3 references, and salary requirements by April 17, 1981 to: Floyd J. Burnett, Manager, Administrative Systems, Computer Services, UMC-37, Utah State University, Logan, Utah 84302. An affirmative action/equal opportunity employer.

SYSTEMS PROGRAMMER

Maine's largest pulp and paper manufacturer has a challenging opportunity in its computer information systems department. This position requires a college degree with a minimum of 4 years systems programming experience on an IBM mainframe. Primary qualifications include DOS/VSE and CICS. Background in VM/370, Power Panvalet and SNA is desirable. Experience in data communications is an asset.

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Systems Analyst with at least 4 years analyst experience on Burroughs computers. Duties include the analysis, design, coding, and documentation of computer banking systems. COBOL experience required. Individual must be bondable. Salary \$26,000 per year. Send resume including work experience and references to Mike Pabian, Job Service of Nebraska, P.O. Box 5200, Lincoln, NE 68505.

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Cullinane Canada, Ltd., the industry leader in computer software, has an unparalleled record for vendor support, systems enhancement, and new product development. Our commitment to service and quality, factors which have helped to establish us as the most financially successful software company in North America, has created an additional Technical Support position in the Ontario Region.

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- 1) Minimum B.S. Degree a must, M.S. in Mechanical Engineering for Systems preferred.
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- 4) Bilingual (English, Spanish a plus)

To explore this excellent career growth opportunity call Ken Levinson, 9 a.m. to 4 p.m., E.S.T. at 305/757-8800 or 7 p.m. to 11 p.m. E.S.T. 305/940-1642 or submit resume to me at 7300 Biscayne Blvd., Ste. 444, Miami, FL 33148.

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You must have strong oral and written communications skills, and experience in the use of a systems development methodology. Ten to fifteen years' experience in Management Information Systems and Manufacturing Systems in particular.

Supervisor EDP Operations

Must have knowledge of DOS/VS, CICS, job scheduling and control.

BA/BS or equivalent, and 2 years in supervision of large mainframe shop.

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Successful candidate must be knowledgeable in CICS command level and TOTAL. Emphasis on DBA.

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Advanced Micro Devices has made a basic commitment to a "New World" in systems development. We're breaking out of our local shell and expanding with a worldwide distributed processing network. Over the next few years we will depart from our current structure based on multiple hardware configurations and move to a consolidated hardware environment. By doing so we will optimize all our data processing service capabilities in a broad-based user-oriented program.

Our new facilities include an all new Computer Center for reporting, forecasting and other data manipulation that will be on line at the user's site. Our new IBM 3033 system will support all New World applications plus major in-house systems, e.g., Order Entry, Accounts Receivable, Inventory Control, and General Ledger. We intend to generate operational support systems "from scratch," emphasizing data base and integration for a full spectrum of business applications. We'll be using all new software—MVS, CICS, TSO, IMS, DMS.

Senior Programmer Analysts—

If you're eager to get involved with design and development projects as well as maintenance and enhancement, you could be generating programs for AMD's business applications in sales and marketing, finance, administration and manufacturing. Your contribution to our New World will take heavy COBOL experience and a background in structured coding and analysis, preferably in an IBM environment. Your Bachelor's degree or equivalent in Business, Math or Science should be supplemented by at least four years progressively responsible experience in programming, analysis and design.

Data Base Analysts—

If you can honestly say that your interest is in the technical aspects of systems design and development, AMD's New World will challenge your expertise with the actual physical design of our data base on the IBM 3033. Your in-depth background in IMS internals is essential and expertise with CICS and DMS is desirable. Three to five years DB/DC experience in a semiconductor industry or related environment and familiarity with large-scale systems are also a must, with an educational equivalent to a BA/BS in Math, Computer Science, Engineering or Business.

Catching the wave in Information Systems at AMD means taking on challenges in a stimulating, user-oriented environment as part of the fastest growing IC company in the nation. It means receiving the recognition and sharing the rewards of our growth and success with one of the best teams in the industry. And it means the best in salaries and benefits, including cash profit sharing, stock purchase plans, complete insurance coverage, and much more.

For immediate consideration, please send your resume to Don D'Andrea, M/S 57, Dept. DDCW, Advanced Micro Devices, 901 Thompson Place, Sunnyvale, California 94086. An equal opportunity employer, m/f/h.



Advanced Micro Devices

Catch the wave

Director of Data Processing \$47,300 (Houston)

Recently established independent governmental authority with headquarters in suburban Houston, seeks Director of Data Processing to direct the establishment of a DP function. Individual will be responsible for planning the creation & start-up of EDP services in a manner that will best support the needs of the agency.

Position reports to the chief executive & requires exp. in both hardware & software selection. Project management exp. & ability to bring up systems within tight deadlines required. Governmental exp. helpful. Reply in confidence with description of your background to our representative: **MR. GREG JOHNSON, 333 CLAY STREET, SUITE 3100, HOUSTON, TX 77002.**

Principles & written replies only. All applicants answered.
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SUNY TWO-YEAR COLLEGE DATA PROCESSING FACULTY

Tenure track position for August 1981. Knowledge of Basic, Fortran, Cobol, RPG, Systems/Assembly required. Master's preferred; teaching, industrial experience desirable. Salary and rank negotiable. Excellent fringe benefits.

For information/application write before May 1st to: Mr. Frederic Smith, Business Division, SUNY Ag. & Tech. College, Cobleskill, NY 12043.
EO/AA Employer.

DALLAS

Performance Analyst Capacity Planning

Multi-CPU MVS/IMS installation needs person with MVS bgnd & desire to work in Perf. Analyst/Capacity Planning area. Knowledge in statistics a plus; full interview/relo/fee paid; to \$34k.

Suite 1109, Stemmons Tower W
Dallas, TX 75207. (214) 637-6360

**DATA PROCESSING
CAREERS**

PRD Electronics Division

IBM SYSTEMS PROGRAMMER

You'll Find
Professional Success Here...
At Harris/PRD

Challenge, excitement, potential for growth and meaningful responsibility are part of the Harris/PRD growth environment. Currently we have a select opening for a talented individual with experience in BAL, COBOL, VM/CM. Converting to MVS. Exposure to DB/DC systems helpful. Degree required.

SYSTEMS ANALYST

3 plus years experience in manufacturing, engineering, and/or financial application utilizing COBOL, Data Base, Data Communications. Applicant will be responsible for systems development and maintenance efforts. Individual will interface with all levels of management. Must have good oral and written skills. Degree preferred.

We invite you to investigate the many unique benefits of this opportunity by submitting your resume to **Mr. Harry Roberts, Employment Manager, Dept. BR, Harris Corporation, PRD Electronics Division, 6801 Jericho Turnpike, Syosset, N.Y. 11791.**



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Systems Engineers Programmers Systems Analysts Project Managers

Consider the following questions:

- Are you a self-starter?
- Have you worked with operating systems at the systems level?
- Do you have a proven track record of successful project implementation?
- Do you enjoy discussing proposed systems with the user?
- Does your present position offer opportunities to advance your knowledge, position and worth, while remaining in the mainstream of the ever challenging DP industry?

If you relate to these questions, we have an opportunity you clearly should investigate as a systems engineer with Data General.

Data General offers one of the industry's widest range of product lines with over 85,000 systems at work around the world. These systems are performing a full spectrum of applications, from real-time energy pipeline control, computer assisted engineering design to distributed and centralized commercial data processing. Our micro, mini and mainframe class computers are complemented by a comprehensive offering of real-time and time-sharing operating systems. Languages include ANSI COBOL, FORTRAN 77, PL/1, BASIC and RPG. Development tools include X.25 networking, IBM compatible 3270, HASP and 2780/3780, CODASYL DBMS, QUERY, COBOL Code Generators and many others. Our commitment to R&D continues to put us far ahead of our competitors and our 30% growth continues to grow year after year.

Data General offers excellent salary and a complete benefits package. If you are interested in joining this dynamic leader, invest in your future by calling Hank Markosian, COLLECT (212) 883-9100 or send resume to his attention: Data General, 633 Third Avenue, New York, N.Y. 10017

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Data General

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SYSTEMS PROGRAMMING MANAGER

Manage systems programmer in the planning, preparation and generation of operating systems and support software for our Corporate Data Center. Also responsible for:

- Defining requirements for and selecting software.
- Developing standards for the use of computer resources including DASD management and tuning.
- Providing application programming support.
- Participating in system configuration, network, and usage planning. (Currently running VSI under VM on an Amdahl V6 with planning under way for conversion to MVS; also running TOPS 10 on two DEC-10's.)

A college degree or equivalent, and 8-10 years experience, including systems programming, and configuration and hardware planning is required. Background should also include 2-4 years of related management experience. Application programming and/or computer operations experience an added plus.

SYSTEMS PROGRAMMERS

Work with a team of systems programmers installing, maintaining, and enhancing IBM operating systems on an Amdahl V6, IDMS data base system, communications network, and software packages. Additional responsibilities include:

- Monitoring computer resource utilization and tuning the system.
- Developing standards and guidelines for the use of computer resources.
- Providing technical assistance and developing specialized program tools for users. (Currently running VSI under VM, with planning under way for conversion to MVS. Maintenance done using SMP4.)

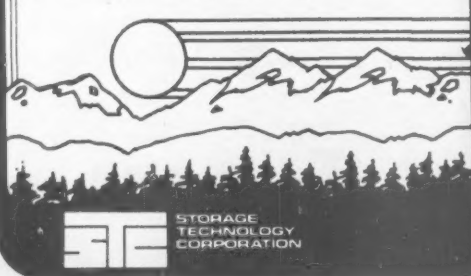
A college degree, or equivalent, and 3-7 years systems programming experience required. Working knowledge of computer hardware, software, and human relations skills a must.

SENIOR DEVELOPMENT ENGINEER

Exceptional opportunity to work in new product development in an MVS environment. Define, design, code, test and document major modifications and extensions to DOS/VSS release 34; participate in product testing by VSS by diagnosing and repairing errors in DOS software base and support field version of DOS base.

BSEE and 5-9 years experience required.

STC offers an excellent compensation package including health and insurance benefits, stock purchase plan and more. Please send your detailed resume in absolute confidence to Mr. Patrick Hart or Ms. Joan Hein, STORAGE TECHNOLOGY CORPORATION, Dept. CW 3/30, 2275 South 39th St., MD 828, Louisville, CO 80027. We are an equal opportunity employer.



STORAGE
TECHNOLOGY
CORPORATION

Systems Programmer

Academic Computing Center at first-class university in beautiful central New York seeks outstanding individual with minimum of two years of system software internals experience. VM, CMS, MVS, CICS, TOPS-10/20, JES-2/3, RSCS, DCF or related background a plus in this upgrade situation. Excellent benefits include dependent scholarships and advanced degree opportunities. Salary: \$19,000 - \$26,000.

SYRACUSE UNIVERSITY

Personal Office
Skytop Office Building
Syracuse, New York 13210

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LIBRARY SYSTEMS ANALYST

The Systems Office is a department of the General Library with a staff of programmers and librarians responsible for the design and development of automated systems supporting a complex library organization of twenty-one branch libraries and units in the Main Library, with a collection of over five million volumes. The Head has responsibility for the planning, development, and continuing evaluation of computer-based applications within the General Library, the Office of Computing Affairs, the Division of Library Automation and other University of California campuses.

Candidates must possess knowledge of data processing and the principles of systems analysis and design. An advanced degree in computing, engineering, or a related field is required. A M.L.S. is desirable but not required.

Salary from \$31,728.00 to \$38,364.00 depending on qualifications. Full job description will be mailed on request. Applicants should apply in writing, including the names and addresses of at least three professional references, by 30 April 1981 to:

Richard L. Beasley
Library Personnel Office
Room 447 General Library
University of California
Berkeley, California 94720

The University of California is an Affirmative Action Employer

MISSISSIPPI STATE UNIVERSITY is seeking Systems Analyst and Project Leader. Degree, COBOL, data base management, and accounting or student record experience preferred. MSU offers an excellent benefit package, a professional work environment, and salaries commensurate with work experience and education. All correspondence will be held in confidence. Send resume including salary history to:

Dr. Fred Davis, Director
Division of Computing Affairs
Mississippi State University
P.O. Drawer CC
Mississippi State, MS 39762

Mississippi State University does not discriminate on the basis of race, color, religion, national origin, sex, age or handicap.

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Graham Magnetics, Inc. Fort Worth Location

The recognized leader in magnetic media production and microprocessor control equipment is seeking an experienced design engineer. Become a member of the GMI team in the electro mechanical technology department in the North Richland Hills facility.

The successful candidate will have a mechanical engineering degree and 4-6 years in mechanical design and packaging of electronic equipment. Excellent salary and full benefits package in an ultra-clean, modern environment. Excellent opportunity for advancement in a rapidly growing company. Reply in confidence:

Forrest Keith

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North Richland Hills, TX 76118
(817) 281-9450



equal opportunity employer M/F

DIRECTOR OF ACADEMIC COMPUTING UNIVERSITY OF MARYLAND COLLEGE PARK CAMPUS

Applications and nominations are invited for the position of Director of Academic Computing. This is a redefined and expanded position formerly entitled the Director of the Computer Science Center. The Campus has recently developed a 5-Year Plan for Academic Computing and many exciting changes in hardware and computing philosophy appear on the horizon. To implement this challenging Plan the Campus looks forward to the appointment of a person with the leadership skills to carry out this Plan with innovation and resourcefulness. The Director will be responsible for the management and development of instructional and research computing throughout the campus and will participate in the University's Instructional and Research Computing Network. Specific responsibilities include the overall management of the Computer Science Center staff and facilities presently UNIVAC 1108ap and 1100/42; the coordination of the various divisional facilities; and, most importantly, long-range planning as well as the establishment and implementation of policies which will enhance academic computing to help achieve the University's commitment to academic excellence.

Demonstrated management skills, previous experience, familiarity with academic computing, and educational background are criteria to be utilized in the selection of the Director. Substantial management experience in computer centers or information systems is mandatory. A relevant doctorate and some experience as a faculty member are desirable.

Salary will be commensurate with qualifications and experience. For full consideration applications should be postmarked by April 27, 1981. Address applications with two copies of curriculum vitae and 3 professional references to:

Dr. Gene T. Sherron
Office of the Chancellor
University of Maryland
College Park, MD 20742

The University of Maryland is an equal opportunity employer.

DIRECTOR OF COMPUTING SERVICES University of Rochester Medical Center

To provide leadership to the Medical Center Computing Facility which furnishes center-wide services with primary emphasis on administrative, instructional, hospital and research requirements. Manage two different computing environments in same shop; batch mode processing (IBM) and timesharing (DEC 10) including a developmental staff dedicated to each machine. The operations of both are common. Will serve as the principal computer services staff officer for the Medical Center and operations liaison representative with other computer centers in the University. Prefer graduate degree and 5-7 yrs. experience with at least 2-3 yrs. in data base management or equivalent. Submit resume to Assistant Personnel Director, Box 636.

University of Rochester
Rochester, New York 14642

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MIS DIRECTOR

"#1" position w/Ohio based large mfr. Candidate must have 8 yrs of solid exp and currently the #1 or strong #2 man in a large IBM shop. Graduate degree a + +. Salary to 65K.



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These systems are housed at our magnificent DATACENTER located in Great Valley, Pa., a beautiful, rural suburb of Philadelphia. Expansion has created exceptional openings in the following areas:

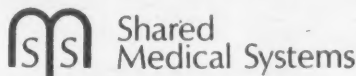
SR. SYSTEMS PROGRAMMER—Working in an on-line environment handling more than 2 Million transactions per day, you'll be involved with system generation, maintenance support and development in a DB/DC environment using TCAM and VTAM to develop and enhance our IBM operating systems. Requires 3 years experience working with OS/MVS operating systems.

JR. SYSTEMS PROGRAMMER—Learn and grow in the above mentioned environment. Requires 2 years experience in programming with exposure to system generation OS/MVS or a similar system.

SYSTEMS PROGRAMMER—Will maintain, enhance and develop operating systems for DEC hardware in support of a highly sophisticated telecommunication system. Requires experience with DEC operating system, PDP-11 and VAX 70's including RSK-11 and RS/TS.

All positions require a relevant college degree or equivalent experience, excellent oral and written communications skills and the ability to work independently.

SMS offers career building responsibility, a dynamic working environment, a salary commensurate with your experience and a full range of company benefits. Send your resume, including current salary, or call COLLECT: Dan Cassino, (215) 296-9431 SHARED MEDICAL SYSTEMS CORP., 650 Park Ave., King of Prussia, Pa. 19406 An Equal Opportunity Employer, M/F.



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Systems Programmers

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We are FLAGSHIP SERVICES CORPORATION, the rapidly growing data processing subsidiary of FLAGSHIP BANKS, INC., and are presently expanding our technical support staff to meet the challenges of the 80's.

Flagship Banks has just recorded its best year ever, garnering assets in excess of \$2.4 billion! Because of this rapid growth, we must add several EDP professionals with strong IBM software backgrounds to our staff. Experience with Teleprocessing and in converting DOS to OS is highly desirable. College degree a plus!

Join us today in the Sunshine State where the cost of living is below average for most large cities and where there is no State income tax. We are offering competitive salaries, a wide range of company paid benefits, including dental insurance and the opportunity to move up quickly within this dynamic company located in the heart of the Sun Belt.

For immediate consideration, we invite you to call (813) 885-9102 collect, or send resume with salary history to:

Tom Shaurette

Flagship Services Corp.
P.O. Box 23300
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The HP Way: Product-Oriented Development



It's developing state-of-the-art products that makes HP a leader. Our Data Communication Operation develops networking systems for both current and next-generation HP computer products. We're looking for Development Professionals who can contribute creatively in these areas:

Remote Networks
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IBM Communications

Your background should include a BSCS or BSEE or the equivalent and three to five years experience in data communications or systems programming or hardware design.

The HP Way also translates into a comprehensive program of benefits to all employees. Among these are cash profit sharing, stock purchase plan (up to 10% of salary), basic life and group medical, dental and disability insurance, and retirement plan.

If the HP Way sounds like your way, please send your resume to L. Spatz, Hewlett-Packard Company, Computer Systems Division, 19447 Pruneridge Ave., Cupertino, CA 95104. We are an equal opportunity/affirmative action employer.



HEWLETT PACKARD

FRAMINGHAM STATE COLLEGE: Assistant Professor or higher, depending on qualifications. Tenure track. Available September 1981. M.S. in Computer Science or equivalent required. Ph.D. preferred. Duties include undergraduate instruction and curriculum development. A possibility exists for a research position involving a reduced teaching load and related summer industrial employment. Chairmanship opportunity in 1982 for interested, innovative person. The Computer Science Department, which is oriented towards systems programming, has strong industrial linkages, an internship program, and a developing graduate program. Contact by April 30 Committee W, Department of Computer Science, Framingham State College, Framingham, MA 01701. Equal Opportunity/Affirmative Action Employer.

Computer Science
Faculty

Currently accepting applications for Sept. 1981 teaching positions in Computer Science Dept. 10 month contract. Duties are teaching undergraduate computer science courses. Minimum requirements are a Master's Degree in Computer Science and strong interest in teaching. Academic rank and salary commensurate with education and experience. Salary is competitive. Apply as soon as possible. Send resume, graduate transcripts and references in confidence to P.O. 1, Embury Field, Aeronautical University, Regional Airport, Daytona Beach, FL 32214.

AA/EEO

[3] COMPUTER SYSTEM ENGINEERS

Electrical Engineers (Professional Status) with software expertise in health related and energy management fields.
*3 years experience with Digital minicomputers and RSK-11M is essential.
*Experience with the 'C' programming language and DEC's assembler is essential.
*Experience with software design and implementation in pharmacy applications and energy management.
*Experience with communication systems and protocols.
*Applicant must be willing to relocate.
*28K Plus.

CONTACT:

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730 Wall - Joplin, Missouri
Layne Campbell - 417-824-4311

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Continuing growth and promotions from within have created exceptional opportunities at BNR, one of the leading R & D laboratories in Ann Arbor, Michigan. The following positions are available immediately.

Distributed Data Processing

Bachelor's Degree in Computer Science or equivalent experience is required. Knowledge and experience with mini or micro computer based systems is desirable. Positions are available in operating systems, languages, and communications subsystems.

Compatible Products

Bachelor's Degree in Computer Science, related field, or equivalent experience. Two years experience in systems development. IBM 3270 emulation experience desirable. Knowledge of BSC, SNA/SDLC or local channel communication protocols a plus.

We offer excellent compensation, three weeks paid vacation after first year, a superior benefit program, a progressive and stimulating environment, and outstanding opportunities for personal recognition and professional growth.

For consideration, please send your resume with salary history or call: Carolyn Williams, Human Resource Manager, BNR Inc., Mail Stop #5, 100 Phoenix Drive, Ann Arbor, Michigan 48106 (313) 973-4700.



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SYSTEMS PROFESSIONALS

Hanes DSD is a division of the Hanes Group and is the selling and distribution unit for L'eggs Products and L'erin Cosmetics, two of the best selling and most sought after hosiery/cosmetics lines in the world.

To meet our growth needs career positions are available to qualified results oriented computer systems professionals for our Winston-Salem headquarters. To be considered, you must have experience in a large scale computer environment utilizing on-line applications, database management and structured design programming methods.

SYSTEMS ANALYST

This position is responsible for designing and developing computer applications in the financial area. 2 or more years in the development and implementation of business systems in a Honeywell 6000 series environment using COBOL language is required. A 4 year degree in computer science, business or math is preferred.

PROGRAMMER ANALYST

This position is responsible for coding, debugging and implementing programs in a batch and on-line environment. 1 or more years programming experience in a Honeywell 6000 environment using COBOL language is required. A 4 year degree in computer science, business or math is preferred.

Hanes DSD can offer you the security of working for a major corporation, as well as the opportunities for personal and professional growth that are inherent in a broad-based company of our magnitude. In addition, the qualified candidates will receive a good salary and excellent benefits package.

Interested individuals should send resume including salary history in confidence to:

Recruiting Coordinator

HANES DIRECT STORE DELIVERY



P.O. Box 2510
Winston-Salem
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CyCare Systems, Inc. is the leading provider of time and information management systems for medical group practices. CyCare can offer you a financially rewarding and professional growth-oriented career. Join a highly professional staff in the development of complex and challenging distributive and stand-alone systems.

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7+ years experience in COBOL and on-line applications. Project leadership and minicomputer experience needed.

Programmer/Analyst (applications)

4+ years experience using COBOL and on-line applications. Individual to lead a team. Must be able to write detailed program specs.

Programmer/Analyst (technical support)

2+ years experience with data base applications using ENVIRON/1 and TOTAL.

Financial Programmer

2+ years experience using COBOL. Must be familiar with accounting systems. Honeywell level 6 experience a plus.

Systems Programmer

2+ years experience on minicomputers using Assembler. Knowledge of disc and real-time systems required. Telecommunications, data base, COBOL & FORTRAN knowledge helpful. For more information and interview, contact: Gary Arnold, Carolyn Conry or Bob Clark at (800) 553-4844 or (319) 556-3131.

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Dubuque, Iowa 52001

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Boston investment services firm (located at Rte. 1 and 128) has opening for field service rep. Will be responsible for testing, installation and service of DEC LSI based systems under RSX-11M and UNIX. Also includes client phone support, internal hardware, operating systems and applications software support. Experience in above areas a plus. We will train the right person for the job. Salary commensurate with experience, compensation package includes good benefits and possible performance bonus. We are a young, progressive firm developing advanced investment portfolio construction and management products delivered via micro-computers. Send resume to

S. Dolgin
Canavest, Inc.
990 Washington St.
Dedham, MA 02026

Department Chairperson + Faculty Positions Computer and Information Science

The College of Business is accepting applications for a department chairperson for Computer + Information Science and for a Faculty Position at the Assistant-Asst. Professor Level for the Academic Year 1981-82.

Marshall University, located in Huntington, West Virginia, enrolls approximately 11,000 students. The College of Business offers quality programs leading to the BBA, BS in Computer Science, MBA and MS in Accounting degrees.

Applicants should hold an earned doctorate in the field; however, those who are ABD will be considered. Business experience is preferred. Rank and salary will be determined by credentials including education and experience.

APPLICATION DEADLINE: April 8, 1981. The College of Business reserves the right to continue to process applications and nominations until the positions are filled.

Contact: Dr. Sara E. Anderson, College of Business, Marshall University, Huntington, West Virginia 25701.

MARSHALL UNIVERSITY IS AN AFFIRMATIVE ACTION EQUAL OPPORTUNITY EMPLOYER.

Data Processing Professionals Move Up to Denver!

We are a national leader in the design and manufacture of medical ultrasound diagnostic imaging equipment located in the desirable Inverness Business Park area outside of Denver. We currently have openings for the following individuals:

Programmer/Analyst

Candidates must have good oral and written communication skills, be thoroughly familiar with program analysis solutions, and have a manufacturing background. A minimum of a Bachelor's degree in math, computer science or related field (or equivalent experience) is required, along with at least 2 years experience with DOS/VSE and COBOL. Familiarity with RPG also desirable.

Programmers

Requirements include a minimum of an Associate degree, at least 1 year of COBOL and RPG programming experience, IBM 370 DOS/VSE and System 3 background plus knowledge of JCL.

We offer excellent salaries and company benefits plus the opportunity to work for a leader in its field. For immediate consideration, call (TOLL FREE) or send letter of inquiry to:

Shirley Norviel
(800) 525-7043

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DATA PROCESSING PROFESSIONALS

Lone Star Gas Company has an immediate need for qualified individuals in SYSTEMS SOFTWARE and APPLICATION SOFTWARE DEVELOPMENT due to growth in the area of data processing at its Dallas, Texas headquarters. We are providing state-of-the-art computer support for business, engineering and special purpose applications. Our installation consists of an IBM 3033 Model N under MVS 3.8, JES 2, CICS/VS and TSO with SPF via a network under TCAM and ACF/VTAM. Consider the following opportunities:

MVS Senior Systems Programmer

Requires three years software experience to be responsible for generating, maintaining, and tuning operating system. To lead implementation to MVS SP1.

CICS Systems Programmer

Requires two years experience with CICS intervals to provide installation, maintenance, and performance tuning of CICS/VS 1.4. To be responsible for implementation of CICS/VS 1.5.

APPLICATION DEVELOPMENT PROFESSIONALS

We have several openings for experienced Systems Analysts and Programmers. These positions require two to five years progressive experience in the development of applications software using PL/I or COBOL. A working knowledge of CICS, DMS, or Mark IV is highly desirable. Lone Star Gas Company offers excellent salaries and an outstanding benefits package. If you would like to grow with us, please send detailed resume including present salary to:

LONE STAR GAS COMPANY
Employment Section
301 South Harwood Street
Dallas, Texas 75201
equal opportunity employer

PROGRAMMER/ANALYSTS

Florida Positions

J.P. International has a pressing need for highly qualified Data Processing professionals to fill existing positions throughout the State of Florida. Market conditions have caused a severe shortage of qualified Programmer Analysts making this an opportune time to evaluate your career in terms of making a change for the better. We can find you positions that offer full relocation, excellent salary, career advancement and complete benefits packages. We have positions for all types of hardware and software from mainframes to minis and all levels from Programmer to Project Leader. Now is the time to act. Call or send resume to:

Attn: Mike Mitchell
920 No. Federal Hwy., Suite 234
Pompano Beach, Fla. 33062
305/941-0205

Experienced counselors needed.
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CONTACT: Bob Greenberg

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Top NC life insurance company wants YOU if: You have 4-5 years analyst experience, some COBOL. You must have group insurance experience and potential to advance to supervisor. Be FIRST and call TODAY, send resume to:

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MATCH YOUR CREATIVE PROGRAMMING WITH A CREATIVE INNOVATOR.

THE TRW-FUJITSU COMPANY, an innovative leader in the design and development of computer-based ATM systems for the financial community, currently has the following career opportunities available:

SR. PROGRAMMER ANALYST

The successful candidate will possess experience programming mini-microcomputers in assembly language. Requirements include BS degree or equivalent with 4 years or more experience. Financial applications knowledge is desired, but not mandatory.

SOFTWARE DATA CENTER SUPERVISOR

The selected candidate will be responsible for the direction and training of computer librarians and operators. Requirements include background in supervision of computer systems operations, as well as possession of the management skills necessary for this key position.

If you qualify for one of the above opportunities, and are interested in joining a company that can offer you a generous salary coupled with outstanding benefits programs, please send your resume complete with salary history and requirements, in confidence, to:

Kathleen Schaefer, Personnel Manager, at:

THE TRW-FUJITSU COMPANY

3606 Silver Star Road
Orlando, Florida 32808
(305) 299-6200

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SYSTEMS PROGRAMMERS

Southeast Banking Corporation is seeking accomplished Systems Programmers to work in their Data Processing affiliate, located in Miami, Florida. Current environment includes IBM 3033 and IBM 370/158, MVS/JES 2 batch and on-line applications. We have immediate openings for:

SYSTEMS PROGRAMMERS

Requires 2-4 years experience in OS/VS 2, (MVS), JES 2/NJE internals, working knowledge of SMP 4, TSO and ROSCOE beneficial. Heavy exposure to trouble-shooting and operating systems.

ON-LINE SYSTEMS PROGRAMMERS

Requires 5-7 years Data Processing experience including 3-5 years experience in CICS/VS or CICS/OS/VS, Sysgen and maintenance. Working knowledge of ACS/NCP, AC/VTAM, SMP beneficial. Heavy exposure to trouble-shooting.

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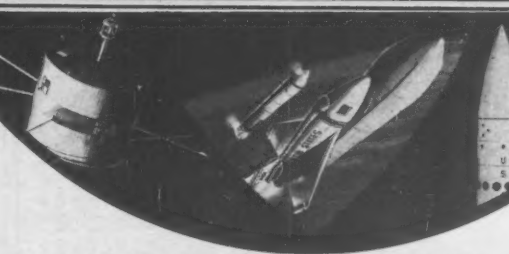
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BS in Electrical Engineering, Computer Science, Math or Electronic Technology. 1-3 years experience in assembly language programming required. Experience with 16 BIT mini computers and/or microprocessors desired. Other high level languages, SNA SDLC, or Line Protocols a definite plus. IBM system experience also desirable. Responsibilities will include the design, development and troubleshooting of various software packages for data communication equipment and systems.

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BS in Electrical Engineering, Computer Science, Math or Electronic Technology. 1-3 years experience in assembly language and cobol programming required. Experience with IBM operating systems in a large scale IBM system a definite plus. Must be able to travel and enjoy customer interface. Responsibilities include customer support and troubleshooting of data communication equipment and systems.

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Utilize your 2 years MVS (or 3 years MVT, MFT, or VSI). You'll install and maintain IBM MVS operating and vendor software, correct problems, assist in scheduling, prepare special programs for support and/or diagnosis. You must know system 370 characteristics, OS/VS Assembler language, IBM Utilities, and MVS.

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We have an immediate opening for a qualified individual to join our Internal Audit Staff. Applicants for this position should be degreed with 2 years of EDP audit experience with a large financial system. This position will also assist in conducting operational audits and experience in this area is desirable, but not necessary. We offer an excellent salary, growth, and benefit package. Interested, qualified candidates submit resume with salary history in confidence to:

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Besides our excellent compensation and benefit package, we offer something very special: Beaverford, Oregon, a suburb of Portland, is our location. This area is typical of the natural beauty of the Pacific Northwest.

If you are qualified and interested, please call **Bob Clay, COLLECT at (503) 641-3151, ext. 154**, or send your resume and salary history to: **Floating Point Systems, Inc., P.O. Box 23489-CW-05, Portland, OR 97223.** We are an equal opportunity employer.



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As Software Design Manager you will lead and build a team of Software Engineers in the development of complete, state-of-the-art real-time systems; robust software products involving both high throughput and high accuracy. We will give you the full Authority and Responsibility to carry out your projects from start to finish. We require that you have a minimum of ten years experience.

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Qualifying applicant must have successful track record in data processing sales. (Top salespeople earned in excess of \$100,000 in 1980.) Available territories include Connecticut, New Jersey, Upstate New York and Long Island, New York.

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Nancy E. Borst, Personnel Manager

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Outstanding opportunity for an individual with a minimum of 5 years experience in operations and programming. Some college level computer science courses helpful. Experience in the following desirable: DOS/VS, DOS/VSE, ACF/VTAM, CICS, ACF/NCP and Telecommunications Network. Work in 4341, 370/145 environment. Attractive salary and excellent benefits.

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We have an on-line database communications network of over 300 devices which includes fiber optic transmission lines. Burroughs large system experience helpful. We offer an excellent benefit package and competitive salary. Call Robert Bass (414) 257-8284 collect or send resume and salary history to:



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Data Processing

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Discounts are available when you run more than 35 column inches of advertising in a year anywhere in Computerworld. Box Numbers are available. \$10 per insertion. Ad Closing is every Friday, 6 working days prior to issue date (issues are dated Monday).

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COMPUTERWORLD

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COMPUTER PROFESSIONALS

IMS DB/DC ENVIRONMENT

The Upjohn Company, a worldwide manufacturer of pharmaceuticals, health care products, chemical and agricultural products, is seeking individuals for the following positions:

DATABASE ANALYST/SPECIALIST

Consult in database planning and design, implement corporate data bases and provide technical expertise in IMS and other data management technologies. At least 2 years experience in database administration required.

SYSTEMS PROGRAMMER

Generate, maintain, and trouble-shoot operating systems or other interactive technologies, including IMS, TSO, CICS, VJPC.

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Assist and eventually lead in the design and development of Business Information Systems. At least 2 years experience in a COBOL/IMS or APL environment required.

The Administrative Data Center at The Upjohn Company is a progressive MVS installation with a 3033 and a 158-AP supporting a large remote terminal network.

This is a unique opportunity for experienced individuals with good planning and coordination skills to contribute to a rapidly growing environment. Bachelor's degree desirable.

We offer excellent benefits, relocation assistance, and opportunity for career growth. Send resume, including salary history, in confidence to:

Jerry Flowers
THE UPJOHN COMPANY
 7000 Portage Road • Kalamazoo, MI 49001
 An Equal Opportunity Employer M/F

Upjohn

SAN FRANCISCO

Several S.F. Bay Area clients are actively looking for Data Processing Professionals at all levels.

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 3 years' mfg. or Financial Systems
 Data Base experience helpful.

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 COBOL, Financial Applications, Banking
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Other positions available include Sales Support, Data Base Design, EDP Auditors and Data Communications Professionals.

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 601 Montgomery St., 17th Floor
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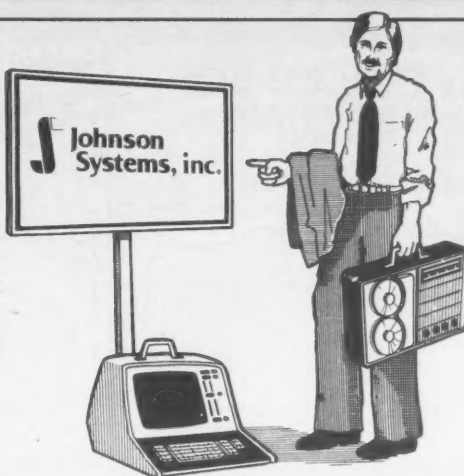
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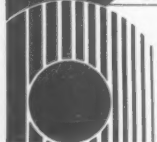
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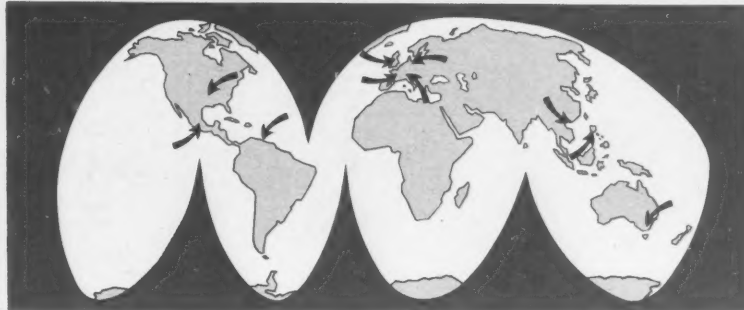
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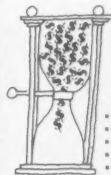
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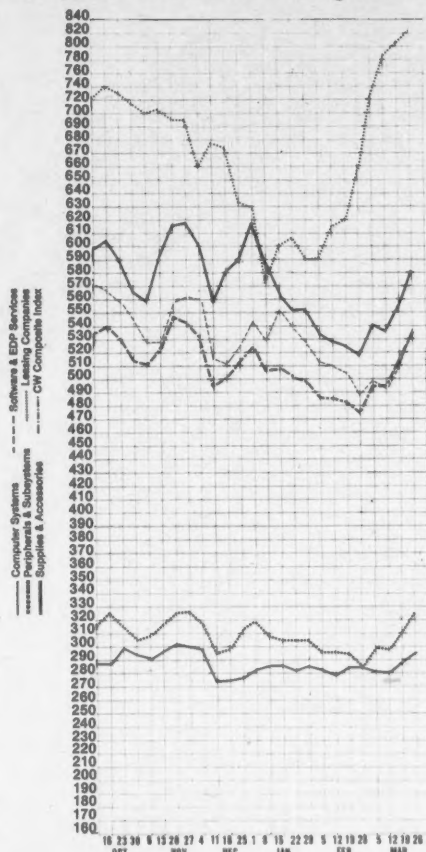
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TRADE QUOTES

CLOSING PRICES WEDNESDAY, MARCH 25, 1981

PRICE					PRICE					PRICE				
	1980-81	CLOSE	WEEK	WEEK		1980-81	CLOSE	WEEK	WEEK		1980-81	CLOSE	WEEK	WEEK
	RANGE	MAR 25	NET	PCT		RANGE	MAR 25	NET	PCT		RANGE	MAR 25	NET	PCT
	(1)	1981	CHNGE	CHNGE		(1)	1981	CHNGE	CHNGE		(1)	1981	CHNGE	CHNGE
COMPUTER SYSTEMS														
A AMDAHL CORP	15-42	37 1/2	+3 7/8	+11.5	O ADVANCED CORP TECH	1-8	3 7/8	+1/8	+0.3	A DATA ACCESS SYSTEMS	8-23	17 1/4	+1	+6.1
N BURROUGHS CORP	47-88	53 1/2	+3/4	+1.4	O ADVANCED SYSTEMS INC	12-15	13 1/2	0	0.0	A DATAPRODUCTS CORP	11-38	38 1/2	+5 1/8	+15.3
O COMPUTER AUTOMATION	8-27	15 3/4	+1 3/4	+12.5	O ANACORP INC	7-24	20	+3 1/4	+18.4	O DATUM INC	2-5	5 3/4	0	0.0
N CONTROL DATA CORP	35-77	65 3/4	+1 5/8	+2.4	O ANALYSTS INTL CORP	3-14	8 3/4	-1/4	-2.7	O DECISION DATA COMPUT	2-8	8 1/4	+3/8	+10.0
O CRAY RESEARCH INC	10-48	40	+3 1/4	+15.1	A APPLIED DATA RES.	8-24	18	+3/8	+2.1	O DELTA DATA SYSTEMS	1-3	2 1/4	0	0.0
N DATA GENERAL CORP	48-87	52 3/4	+4 7/8	+10.1	N AUTOMATIC DATA PROC	31-54	54	+2	+3.8	O DELTA DATA SYSTEMS	8-37	8 3/8	+1/4	+2.7
N DATAPoint CORP	22-80	60 1/4	+8 3/8	+18.4	O CDA COMPUTER ASSOC	8-17	12	-1/2	-4.0	N ELECTRONIC M & N	3-8	5 3/8	+1/8	+2.8
N DIGITAL EQUIPMENT	32-88	88 5/8	+2 7/8	+3.3	O COMPUTER HORIZONS	1-5	2 1/4	0	0.0	O EVANS & SUTHERLAND	21-83	88	+3	+4.6
A EECO INC	8-17	13	+1/8	+0.8	O COMPUTER NETWORK	4-9	4 5/8	-1/4	-5.1	O FARRI-TEX	1-4	3 1/8	-1/8	-3.8
N ELECTRONIC ASSOC.	8-12	8 1/8	+5/8	+6.3	N COMPUTER SCIENCES	11-30	18 1/4	+1	+5.7	O GENERAL COMPUTER SYS	1-12	10 3/4	-1/2	-4.4
N FOUR-PHASE SYSTEMS	18-48	31 3/4	+4 5/8	+17.0	O COMPUTER TASK GROUP	1-23	18 3/4	+1/4	+1.3	O GEN'L DATA CORP IND	8-22	14 7/8	-1/4	-1.6
N FORBES	31-80	55 7/8	-3 5/8	-8.0	O COMPUTER USAGE	2-10	5 3/4	-1/4	-4.1	O GENERAL TERMINAL CP	1-4	1 1/2	0	0.0
O GENERAL AUTOMATION	7-18	11 1/8	-3/8	-3.2	O CONSHARE	11-21	13 1/2	0	0.0	N HAZELTINE CORP	12-33	22	+5/8	+2.8
O GRI COMPUTER CORP	1-3	1 1/2	0	0.0	O CULINANE DATABASE	18-48	48 1/4	+4	+8.0	O INFORMATION INTL INC	8-15	12 3/4	0	0.0
N HARRIS CORP	25-35	34	+2 1/4	+4.3	O DATA DIMENSIONS INC	1-8	2	+7/8	+77.7	O INTEL CORP	23-30	37	+2 3/4	+8.0
N HEWLETT-PACKARD CO	48-85	80	+2 5/8	+3.0	O DATATAB	4-18	14 1/4	0	0.0	A LUNDY ELECTRONICS	4-17	10 7/8	+3/4	+7.4
N HONEYWELL INC	85-115	103 7/8	-7/8	-3.5	O DST CORP	4-9	5 7/8	+3/4	+14.8	O MSI DATA CORP	3-18	18 1/8	+1/4	+1.3
N IBM	50-78	83 7/8	-7/8	-1.3	O DYATRON CORP	4-11	5 1/2	0	0.0	N MEMOREX	10-34	11 3/4	-1 3/4	-12.8
O MAGNUSON CORP SYST	20-48	31	+1 1/2	+5.0	N ELECTRONIC DATA SYST	18-50	48	+4	+8.8	N RHOMAX DATA SCI	10-31	24 1/8	+2 3/8	+12.2
N MANUFACTURER ASSOC	8-25	15	+1	+7.1	O INFORMATICS INC	8-26	25 3/8	-7/8	-3.3					
SOFTWARE & ED SERVICES														
C FINI-COMPUTER SYST	1-8	1 5/8	0	0.0	O INSYTE CORP	1-3	2 1/2	0	0.0	O NETWORK SYSTEMS CORP	14-25	18	+1 3/8	+7.8
N MODULAR COMPUTER SYB	8-31	14	-3/8	-2.8	O IPS COMPUTER MARKET	1-4	1	0	0.0	O ONEY	2-12	8	-1	-10.0
A NCR	52-82	83	-1 3/4	-2.7	O KEANE ASSOCIATES	3-8	5 1/4	0	0.0	A PARADYNE CORP	8-38	38 1/8	+2 1/4	+8.3
N PRIME COMPUTER INC	10-41	34	+3 5/8	+11.8	O KEYDATA CORP	1-5	7/8	0	0.0	A PENRIL CORP	8-18	14 5/8	+1	+7.3
N PERKIN-ELMER	13-35	31 1/4	+3	+10.6	A LOGICON	12-34	33 1/2	+2	+6.3	O RANKEE CORP	10-23	17 1/4	0	0.0
N SPERRY CORP	42-85	58	+1/8	+0.2	O MATHEMATICAL INC	14-38	14 1/4	0	0.0	O RECONITION EQUIP	5-21	15 7/8	+1 1/8	+7.8
O TANDEN COMPUTERS INC	13-78	78 1/4	+5 1/4	+7.3	O MATHEMATICAL APP GRP	7-33	18 1/2	0	0.0	O SCAM DATA	1-5	2 3/4	+1/2	+21.6
N TEXAS INSTRUMENTS	78-150	119 1/4	+3	+2.3	O NATIONAL DATA CORP	5-18	18 1/4	+1 1/2	+8.4	N STORAGE TECHNOLOGY	12-27	27 1/4	+2 1/4	+8.0
A HAND LABS	17-80	35 3/8	+1 1/2	+4.4	N PLANING RESEARCH	5-17	7 1/8	+3/8	+5.8	O SVKES DATATRANICS	14-50	44	+8	+22.2
LEADING COMPANIES														
O BOOTH FINANCIAL CP	13-27	22 1/2	+1 1/4	+5.8	O PROGRAMMING & SYS	1-1	1	0	0.0	A TEC INC	3-8	3 7/8	0	0.0
N COMISCO INC	8-24	21	+1 3/4	+8.0	C RAPIDATA INC	4-11	8 5/8	+1/4	+3.8	N TEKTRONIX INC	42-70	54 7/8	+3/4	+1.3
A COMMERCE GROUP CORP	1-2	1 1/8	0	0.0	O REYNOLDS & REYNOLD	18-34	22	+2 1/4	+11.3	N TELEX	3-8	8 1/8	+7/8	+12.0
A COMPUTER INVSRTS GRP	1-4	1 1/2	0	0.0	O STEC INC	8-28	18 3/4	-3/4	-3.8	O TEGDATA SYSTEMS CP	8-28	7 7/8	+1/4	+14.4
O CONTINENTAL INFO SYS	2-15	5	0	+14.2	O SCIENTIFIC COMPUTERS	3-17	11 1/2	-1/4	-2.1	A TIMEPLEX INC	5-22	14	+2 1/4	+18.1
N DATACRUISE RENTAL	3-5	4 1/2	0	0.0	N TYMSHARE INC	17-50	49	+4 3/8	+8.0	O WILTEK INC	1-3	2 3/4	0	0.0
A DCL INC	3-8	2 7/8	0	0.0	A URS CORP	5-17	13 7/8	+3/4	+5.7					
N DFF INC	3-12	8	-1/4	-2.7	N WYLY CORP	4-20	14	+2 1/8	+17.8					
O ITEX	1-15	1 1/4	0	0.0	SUPPLIES & ACCESSORIES									
O LEASAPAC CORP	1-2	3/8	0	0.0	N AM INTERNATIONAL	11-24	18 3/8	+7/8	+5.8	A AMERICAN BUS PRODS	8-18	15 3/4	-1/4	-1.3
A PIONEER TEX CORP	2-4	3	0	0.0	A ANDERSON JACOBSON	8-23	18 5/8	-1 1/2	-7.4	O BALTIMORE BUS FORMS	1-2	1 1/2	0	0.0
N RELIANCE GROUP INC	24-78	75 5/8	+2 1/2	+3.4	O AUTO-TROL TECHNOLOGY	18-62	32	+3 1/2	+12.2	N BARRY WRIGHT	8-22	12 3/4	+1	+3.3
N U.S. LEASING	12-28	27 5/8	-1/8	-0.4	O BEVENTE INT'L	2-18	14 1/4	-1/4	-1.7	O CYBERPICS INC	1-2	1	0	0.0
PERIPHERALS & SUBSYSTEMS														
					A BOLT-BERANEK & NEW	12-37	35 3/8	+1	+2.8	O DUPLEX PRODUCTS INC	11-18	13 1/4	0	0.0
					N BUNKER RAND	17-52	50	0	0.0	N FINNIS BUS FORMS	13-21	17 1/8	+5/8	+3.7
					C CARBRIDGE MEMORIES	1-8	5	+5/8	+31.2	O 3M COMPANY	48-83	84 3/8	+2 5/8	+4.2
					N CENTRONICS DATA CORP	13-35	18 1/8	+1 1/8	+7.5	O MOORE CORP LTD	27-38	38 3/8	+1 1/8	+3.0
					A OPTIC CORP	3-8	7	-1/4	-3.4	N NASH CORP	20-38	38 1/2	+1 1/4	+0.8
					O COMPUTER DEVICES INC	5-10	8	-1/2	-5.2	O STANDARD REGISTER	22-39	33 3/4	+3/4	+2.2
					O CONTROTRONICS	1-10	8 3/4	-7/8	-8.0	A TAB PRODUCTS CO	8-30	18	+1 5/8	+8.8
					O COMPUTER COMMUN.	2-10	2 5/8	0	0.0	N WALLACE BUS FORMS	12-28	23 7/8	+3/4	+3.2
					O COMPUTER CONSOLES	4-28	23 1/2	+3 3/4	+18.9					
					O COMPUTER TRANSCIVER	1-8	4	-1/8	-3.0					
					N COMPUTERVISION CORP	24-82	82 1/4	+8 5/8	+32.2					
					N CONRAC CORP	13-25	18 5/8	+1/4	+1.2					
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